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Final Environmental Impact Statement Grand Strand Region, South Carolina EPA Project No. C450381

Environmental Protection Agency, Atlanta, Ga Region IV

Aug 77

EPA 904/9-77-021 EIS

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FINAL
ENVIRONMENTAL IMPACT STATEMENT

GRAND STRAND REGION
SOUTH CAROLINA
EPA PROJECT NO. C450381

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND ST., ATLANTA, GA. 30308

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16. Abstracts

The subject action of this Environmental Impact Statement is the awarding of grant funds to the Grand Strand Water and Sewer Authority for regional wastewater treatment facilities to service the Grand Strand, S.C. 201 area. Major issues involved in the EIS are water quality and secondary impacts resulting growth supported by the project. The EIS consists of three major sections. These are a description of the existing environment, an evaluation of alternatives, and a more detailed evaluation of the effects of the chosen alternative. The project consists of the construction of three new wastewater treatment facilities with accompanying outfall lines and interceptor systems and the upgrading of the existing MB-1 wastewater treatment facility total first phase capacity of the system will be 26.8 MGD with discharges into the Waccamaw River and the Intracoastal Waterway.

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ERRATA SHEET

Second and third pages of Figure I
following page 35 should be reversed

FINAL ENVIRONMENTAL IMPACT STATEMENT

GRAND STRAND REGION, SOUTH CAROLINA

EPA PROJECT NO. C450381

Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Approved

Jack E. Ravan
Regional Administrator

SUMMARY SHEET FOR ENVIRONMENTAL
IMPACT STATEMENT

GRAND STRAND REGION, SOUTH CAROLINA

EPA PROJECT NO. C450381

Draft ( )

Final (X)

Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

1. Type of Action: Administrative (X)
Legislative ( )

2. Brief Description of Proposed Action

The subject action of this Environmental Impact Statement is the awarding of grant funds to the Grand Strand Water and Sewer Authority for the preparation of plans and specifications for regional wastewater treatment facilities to service the Grand Strand 201 area. The project consists of the construction of three new wastewater treatment facilities with accompanying outfall lines and interceptor systems and the upgrading of the existing MB-1 wastewater treatment facility. Plant A will have a first phase capacity of 6.0 MGD facility discharging with a tertiary level of treatment into the Intracoastal Waterway. Plants G and C will have capacities of 6.0 MGD and 2.8 MGD respectively discharging with a secondary level of treatment into Waccamaw River. Plant B-1 will have a first phase capacity of 12.0 MGD and will discharge into the Waccamaw River in the same outfall line with Plant G with a secondary level of treatment.

3. Summary of Major Environmental Impacts

The proposed action will have the following beneficial impacts:

(1) Alleviation of existing adverse conditions caused by low quality wastewater discharges.

(2) Wastewater treatment facilities to accommodate existing and future sources of wastewater.

(3) Allowance of orderly growth in the Grand Strand area.

The proposed action will have the following adverse impacts:

(1) Potential erosion of treatment plant sites and interceptor routes during construction.

(2) Minor decrease in biological productivity of the floodplain from construction and operation of Plant C.

(3) Temporary noise and odor impacts during construction.

(4) Potential of Plant C for incompatibility with Litchfield Country Club Community.

(5) Potential burden of proposed action on solid waste disposal system.

4. Summary of Alternatives Considered

A total of 13 basic regional wastewater treatment plant configurations were identified. These configurations included combinations of 1, 2, 3 and 4 regional treatment plants with continued use of various existing plants. A detailed description of each of these alternatives is presented in the Draft Environmental Impact Statement.

The initial analysis of the above 13 alternatives resulted in the selection of a three region plant system with all plants having secondary treatment. However, problems with the water quality model used as a basis for the development of these alternatives led to the development of seven additional treatment alternatives. These alternatives included various combinations of advanced wastewater treatment with discharge into the

Intracoastal Waterway and land application of effluent from Plants A and MB-1.

Following publication of the Draft EIS, additional water quality modeling information became available which led the State to prohibit any discharge into the ICWW at Plant MB-1. Because of these new developments, the feasibility of constructing a force main from Plant MB-1 to Plant G was evaluated. This alternative would allow the effluent from Plant MB-1 to be discharged into the Waccamaw River in the same outfall line with Plant G.

5. The following Federal and State Agencies and interested groups have submitted written comments on the Draft Impact Statement:

Corps of Engineers
Department of the Air Force
Department of Commerce
Department of Health, Education and Welfare
Department of the Interior
Department of Housing and Urban Development
South Carolina Department of Health & Environmental Control
State Clearinghouse, Division of Administration
South Carolina Department of Archives and History
Pee Dee Health Systems Agency

South Carolina Wildlife and Marine Resources Department

South Carolina Water Resources Commission

South Carolina Land Resources Conservation Commission

City Manager, North Myrtle Beach

South Carolina Wildlife Federation, Waccamaw Chapter

Brookgreen Gardens

6. Date made available to CEQ and the Public

The Final Statement was made available to the Council on Environmental Quality and the public on August 12, 1977.

PREFACE

On March 11, 1977, the Environmental Protection Agency, Region IV, issued a draft Environmental Impact Statement (EIS) on the administrative action of awarding grant funds to the Grand Strand Water and Sewer Authority for the preparation of plans and specifications for regional wastewater treatment facilities to service the Grand Strand area. The EIS was filed with the Council on Environmental Quality, circulated for review among various Federal and State agencies with expertise in the matters therein, and made available to the public.

Contained herein are revisions and additions to the Draft EIS. These revisions and additions are based upon comments from interested parties or further EIS information. The basic configuration of the project has not changed from the alternative recommended in the Draft EIS. Three new wastewater treatment plants will be constructed with accompanying outfall lines and interceptor systems. In addition Plant MB-1 will be upgraded and expanded. Changes have been made in the treatment processes and outfall location of Plant C and Plant MB-1. These changes consist of the use of bio-disc systems at both plants and the construction of a common outfall to a point in the Waccamaw River which allows for secondary treatment throughout the planning period. The design year size of Plant MB-1 has been expanded to 12.0 MGD.

Rather than reprinting the text, figures, and tables of the Draft EIS, the Final EIS should be read in conjunction with the Draft. This document, when appended to the Draft EIS, shall constitute the final environmental impact statement in accordance with the Guidelines of the Council on Environmental Quality, 40 CFR 1500, and with EPA's Final Regulations governing preparation of environmental impact statements, 40 CFR 6.

Chapter I contains a summary of the Draft EIS document. This chapter presents an overview of the project history and area, identifies significant impact issues to be dealt with in the EIS and identifies key features of the existing environment. It includes a summary of the alternatives analysis and the proposed action, and it presents the principal findings and conclusions of the EIS.

Chapter II contains additions and revisions to the content of the Draft EIS.

A Public Hearing on the Draft was held in Myrtle Beach on March 11, 1977. Chapter III contains a transcript of that hearing as well as Agency response to all comments and questions raised.

Chapter IV reproduces all written comments on the Draft EIS with appropriate response to all comments and questions.

Finally, Chapter V presents EPA's conclusions and administrative decisions concerning the Grand Strand Water and Sewer Authority's grant application.

Publication of the Final EIS on the awarding of grant funds for the preparation of plans and specifications for regional wastewater treatment facilities to service the Grand Strand area fulfills EPA's responsibilities under the National Environmental Policy Act and EPA's regulations for environmental review of construction grant application. In accordance with these regulations, a Step II grant offer will be made to the Grand Strand Water and Sewer Authority thirty days after this Final EIS is filed with the Council on Environmental Quality and made available to the public. Anyone receiving this document who does not have a copy of the Draft may request a copy from:

John E. Hagan III, Chief
Environmental Impact Statement Branch
Environmental Protection Agency
345 Courtland Street
Atlanta, Georgia 30308

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CHAPTER I

SUMMARY

A. INTRODUCTION AND BACKGROUND

1. LEGAL BASIS FOR THE EIS

The U.S. Environmental Protection Agency (EPA) is the administering agency for a major Federal environmental program entitled "Grants for Construction of Treatment Works."[1] This program allows the EPA administrator to provide financial aid to any state, municipality, intermunicipal agency, or interstate agency for the construction of publicly owned water pollution control facilities. The program will encourage reduction of point sources of water pollution and improve national water quality.

The EPA's granting of funds for a water pollution control facility may require an EIS. Each proposed water pollution control facility is evaluated on a case-by-case basis by the appropriate EPA regional office to determine whether the proposed facility is expected to have significant environmental effects and whether the system proposed appears to be a cost-effective solution to area water quality problems.

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1. Authorized by Title II, Section 201 (g(1), of the Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500 (FWPCA.A).

The EIS is being issued pursuant to P.L. 91-90, the National Environmental Policy Act (NEPA) of 1969, and Executive Order 11514, "Protection and Enhancement of Environmental Quality" dated March 5, 1970. Both NEPA and Executive Order 11514 require that all Federal agencies prepare such statements in connection with their proposals for major Federal actions significantly affecting the quality of the human environment.

This document has been prepared in accordance with the regulations and guidance set forth in the President's Council on Environmental Quality (CEQ) Guidelines dated August 1, 1973 and the EPA's Final Regulations 40 CFR-Part 5, dated April 14, 1975.

2. SCOPE OF THE EIS

The EIS addresses the alternatives for meeting water quality standards in the 400 square mile coastal area surrounding Myrtle Beach, South Carolina. On March 11, 1977 the Draft EIS was filed with the Council on Environmental Quality and made available to the public. Major chapters in the DEIS include a description of the existing environment, an analysis of alternatives for the provision of wastewater treatment facilities, a description of the proposed project, a description of the primary and secondary impacts of the proposed project upon the natural and manmade environments, and recommended measures to initigate adverse impacts.

The Final EIS contains a summary of the information presented in the DEIS, additions and revisions to information contained in the DEIS, a transcript of the public hearing held April 11, 1977 and EPA references to comments presented at the hearing and written correspondence received on the DEIS and EPA response to these comments.

The question of controls for non-point sources of pollution (e.g., surface runoff) is being dealt with separately under the areawide wastewater management planning effort currently underway in accordance with Section 208 of the 1972 Water Quality Act Amendments.

3. OVERVIEW OF THE PLANNING AREA

The Grand Strand sewer planning area is roughly defined as the land area in Georgetown and Horry Counties lying between the Intracoastal Waterway and the Atlantic Ocean. It encompasses four county census districts, three in Horry County, and one in Georgetown County.

Within the planning region, there are three areas with unique characteristics. Area 1 in Horry County has intensive commercial, residential, and recreational development along the Atlantic Ocean. Its growth and environmental problems are the most advanced. Area 2 in Georgetown County has development similar to Area 1, but is somewhat protected from rapid growth and seasonal change by the presence of large open areas. Area 3 combines commercial and institutional development along U.S. 501 with residential development between Nixon's Crossroads and the Little River. Although the remainder of the area is undeveloped, the International Paper Realty Corporation has begun to plan development for the Buist Tract.

Community services are provided by a combination of State, county, and municipal agencies. The Waccamaw Regional Planning and Development Council is a non-governmental organization which initiates and coordinates planning and development for a seven-county region which includes Georgetown and Horry Counties. The Council is also the designated A-95 agency for reviewing federally funded projects. The planning area is served by motor transport (automobiles, trucks, busses) and aviation. There is no mass transit system. Water and sewage services are coordinated by the Planning Council, Grand Strand Water and Sewer Authority, Horry County Water and Sewer Authority, and Georgetown County Water and Sewer District.

4. PROJECT BACKGROUND

The Grand Strand Water and Sewer Authority is applying for a Federal grant to build wastewater treatment facilities for the

Grand Strand area of Horry and Georgetown Counties in South Carolina. The proposed plan has as its main goal provision for adequate treatment and disposal of the area's wastewaters, both now and to meet the needs of the growing permanent and tourist populations. Specific objectives include:

(1) Elimination of public health risks associated with existing treatment facilities

(2) Opening of certain closed shellfish areas

(3) Attainment of water quality standards in the Intracoastal Waterway and the Waccamaw River.

The existing regional treatment system consists of ten municipal plants, the Myrtle Beach Air Force Plant, approximately sixty package plants, three industrial wastewater treatment plants, thousands of septic systems, and numerous sewage lagoons. Much work has already been done in the development of this system to attack surface water quality problems. However, critical water quality problems remain in the several major waterways in the area, and in coastal wetlands.

The Grand Strand Water and Sewer Authority was created on June 2, 1971 to deal with the area's problems of water pollution and wastewater management. Work on the plan began in January 1974 and a draft plan was made available for public review in

May 1974. The planning area was divided into three separate service areas accommodating the three new regional treatment plants which comprise the final plan - treatment plant A, approximately two miles inland from Atlantic Beach in the north; treatment plant G, in-shore from Garden City and Surf Side, near highway 544 in the coastal section of Horry County; and treatment plant C, located on the site of the present Litchfield beach plant, just inland from Litchfield beach in the south.

The facilities proposed in the 1974 plan incorporated the following features:

(1) Secondary treatment of wastewater

(2) Flow equalization or modular treatment units to accommodate high seasonal flows

(3) Discharge of effluent in the first two phases of construction to the Intracoastal Waterway

(4) Sludge disposal by spraying of liquid sludge on golf courses

(5) Location of transmission lines, primarily on roadway rights of way

(6) Phasing of construction to meet expected patterns of growth and water quality needs.

EPA determined that an Environmental Impact Statement was required for the proposed action, and preparation for such a statement began in July 1975. In November 1975, questions were raised regarding water quality in the Intracoastal Waterway as affected by effluent discharges from the northern plant A and the central plant G. The environmental impact analysis was suspended with the following additional activities taking place:

(1) Water quality modeling studies of the Intracoastal Waterway were conducted.

(2) Size of the wastewater treatment plants was scaled down in accordance with the population projections.

(3) Seven modified alternatives were developed and evaluated for the north service areas. The most significant of these alternatives was an effluent disposal method using spray irrigation of golf courses and rural land.

In October 1976, efforts were resumed to complete the Environmental Impact Statement on the entire plan. Notice of the Draft EIS was published in the Federal Register of March 11, 1977. A public hearing was held in Myrtle Beach on April 11, 1977.

5. SIGNIFICANT IMPACT ISSUES

(1) Water Quality

Water quality is of concern in the Grand Strand region in four areas:

(A) The Intracoastal Waterway

(B) The Waccamaw River

(C) Certain coastal wetland shellfishing areas

(D) Beaches

Water quality sampling was done in the Intracoastal Waterway in April and August 1972. During April, the mean total and fecal coliform densities were recorded as follows:

	LOCATION (From Myrtle Beach Waste Discharge)	
COLIFORM DENSITY MPN[2]/100ml	UPSTREAM	DOWNSTREAM
TOTAL	540	4700
FECAL	59	1100

The largest waste discharge occurred from the lower Myrtle Beach oxidation pond about 3 1/4 miles downstream from the Myrtle Beach Air Force Base discharge.

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[2] MPN=most probable number of organisms

During the peak tourist season the corresponding results were as follows:

COLIFORM DENSITY	LOCATION	
	UPSTREAM	DOWNSTREAM
TOTAL	700	67,000
FECAL	59	3,400

Class A standards for fecal coliforms call for a maximum of 200 MPN/100 ml.

A water quality model of a 36 mile segment of the ICWW from the Little River Inlet to the junction with the Waccamaw River was developed. Results are presented in Figure I-1 in the DEIS for this 36 mile segment for July low flows for the case of non-point source discharges. Because of limited data the accuracy of these results is considered questionable. Nevertheless, results indicate that DO standards could be marginally met with no discharges.

The Waccamaw River, downstream of Conway to the Route 17 bridge, violated dissolved oxygen and fecal coliform criteria. Since the central plant G was designed to have its outfall to the Waccamaw River, water quality standards and associated wasteload allocations are critical to the location of the outfall.

Four primary shellfishing areas have been closed in recent years as a result of water pollution:

(A) All of Little River Estuary

(B) All of the Midway Inlet up to the headwaters of the northern area of Midway Inlet

(C) All of Parsonage Creek to its conjunction with Allston Creek at Weston Flat at Murrell's Inlet

(D) All of Winyah Bay, up to the southern portion of North Island.

In addition, Murrell's Inlet is open on a conditional basis. Closings occur automatically when three inches or more of rain falls, or when monitoring results so indicate. A primary objective of the wastewater facilities plan is [illegible] reduce septic tank use and improve the effluent quality of wastewater facilities, to provide for reopening of these shellfishing areas.

(2) Projected Growth

The area includes two populations - a year-round permanent population and a transient tourist population. During the period 1960-1970, population in the planning area grew approximately 20 percent, a higher rate than the county-wide growth rate of either county. During this period, the population of Georgetown

County declined. Since 1970, the two counties have experienced greater growth, largely as a result of the growing tourist economy.

In 1972, approximately 10 million people visited the Grand Strand. On the basis of the total transient accommodation units available and the number of persons per unit, the Waccamaw Regional Planning and Development Council estimated the number of overnight visitors and day visitors and the total peak day population at 232,000.

The WRPDC population projections used in the 201 Plan estimated a 1997 total of 149,641 permanent residents and 634,210 summer residents. Questions were raised concerning the accuracy of these projections.

(3) Treatment Configuration and Construction

The Grand Strand area is served by a proliferation of small municipal treatment facilities, package plants, and septic tanks. Because of its popularity as a resort area, continued growth is anticipated. The problems addressed in the 201 Facilities Plan and in the alternatives analysis section of this EIS, deal with the development of the most effective area-wide treatment system. Major issues include the following:

(A) What are the real growth requirements which must be met?

(B) Can the present configurations, supported by additional septic tanks and package plants, effectively meet the anticipated growth?

(C) Will interceptor construction and plant construction disrupt the natural or manmade environment?

(D) If central treatment plants are to be built, how many should be built, where should they be located, and what treatment technology should be used?

(E) How can liquid effluent from wastewater plants be most effectively disposed of?

(4) Sludge Disposal

The primary issue raised with regard to the disposal of municipal sewage sludge relates to the direct application of digested sludge on land areas, including golf courses and other green areas, compared with composting or land fill as the two primary alternatives.

(5) Secondary Impacts Resulting from Growth

A central issue in the construction of new wastewater treatment facilities is whether the added capacity, in itself, will induce growth beyond that which might occur under the no action alternative. Under the no action alternative, it is assumed that septic tanks would continue to be used in suitable areas (but with more stringent enforcement of size and maintenance requirements) and that package plants would be used to meet new community needs. If induced growth seems likely, one can consider the community effects of this growth to be a secondary impact of the plant.

Impacts of growth on the community can be expected in the following areas:

(A) Need for increased community services

(B) Increased transportation congestion resulting in a demand for improved roads and a decrease in air quality

(C) Reduction of open spaces resulting in a loss of elements of the natural environment.

(6) Ecological Impacts of Growth

Biological impacts may be experienced from continued development of vacant and wooded lands. The increased vehicular traffic and normal activities of an increasing population will cause additional dust and pollutant loading in the air and streams. Poor land development practices and alteration of natural drainage patterns could eventually cause a gradual disappearance of the more delicate tropical plant species found in the Grand Strand area, unless appropriate mitigative measures are applied.

(7) IMPACTS TO HISTORIC AND ARCHEOLOGICAL RRSOURCES

The planning area contains several types of historical sites including houses of architectural significance, plantations, historic churches and cemeteries, and several sites which played a role in the Revolutionary and Civil Wars. The area also has numerous archeological sites. There is evidence of Indian camps and Confederate earthworks as well as two mounds recently discovered just north of Georgetown. Construction of sewage treatment facilities without proper planning could severely damage cultural resources in the area.

(8) Local Share of Costs

As in any public works program, the ability of the community to meet its share of construciton costs, and the total annual cost of operation, is of concern. The added cost to the community compared with the additional revenue generated by the increased population, must be evaluated.

The ability to finance or support these improvements will depend upon several factors including:

(A) Increases in the assessed valuation of real property

(B) Median income of permanent population

(C) Changes in tourist spending patterns and activity levels

(D) Federal and State grant and funding programs.

B. EXISTING ENVIRONMENT RELATED TO SIGNIFICANT IMPACT ISSUES

1. DEMOGRAPHY, LAND USE AND ECONOMICS

(1) Demography and Land Use

The planning area consists of three sections which each have distinctive demographic and development characteristics. They vary in density of development as well as in land use patterns. The higher density occurs along the Atlantic Ocean, particularly in the City of Myrtle Beach which contains commercial development and several condominium projects. Along Route 17, opposite the ocean, much land is undeveloped. That which is developed is used for commercial and residential uses at a much lower density than the ocean-front land. Beyond the Intracoastal Waterway, developed land is devoted to manufacturing and institutional facilities. Much of this area is currently undeveloped forest and open space.

(2) Economics

The planning area has four principal economic activities of which tourism is the most important. Since the area offers year-round recreational opportunities, the structural development (hotels and restaurants) lends a more permanent appearance than similar resort areas at coastal beach communities in the north.

In addition to its importance as a source of employment, the tourism industry brings money into the community. Tourist spending on the Grand Strand reached nearly $400 million in 1972. This money flowed from Grand Strand retail and service establishments to manufacturers and suppliers, thereby generating dollars in trade and payroll in other economic sectors.

Manufacturing is the second most important economic sector. It includes milled lumber, food processing, printing, and production of furniture, textiles and clothing. Of the two counties, Georgetown County is most dependent on manufacturing. In 1973, manufacturing accounted for 22 percent of the total county-wide industrial payroll of $110 million. Between 1970 and 1973, both Georgetown and Horry Counties added new manufacturing units at a faster rate than the state rate, although Georgetown County lags behind Horry County and the State in adding new employees.

Agriculture has little economic importance to the planning area, but still plays an important role in other areas of the two counties. Major products are tobacco, eggs, soybeans, and lumber. Fulltime agricultural employment levels have declined.

Peak seasonal flow is three to six times greater than permanent population flow. This places excessive loads on existing treatment facilities, including septic tanks, during March through September. Many existing systems fail to perform at their designed capabilities due to poor operation and maintenance.

2. TERRESTRIAL BIOLOGICAL COMMUNITY

Among the 150 or more species of trees, woody vines, shrubs and other vegetation in the planning area are several rare or infrequent types. These types occur in small numbers and in restricted areas. Although not necessarily threatened with immediate extinction, these species may require special care.

The large variety of Grand Strand region wildlife includes both common and rare or endangered species of reptiles, birds, and mammals. Over 100 species have been sighted, many of which are established residents. Both established and migratory wildlife rely upon the habitats provided by the area's natural vegetation.

3. WASTEWATER TREATMENT SYSTEM

There are six major municipal and military wastewater treatment plants in the planning area which constitute 80 percent of the total plant capacity of the area. These plants together with their designed capacity and their effluent receiving stream are summarized below.

PLANT	DESIGN CAPACITY MGD	RECEIVING STREAM
MB-1	6.0	ICWW
NMB-1	1.0	ICWW
NMB-2	1.2	ICWW
AF-1	0.75	ICWW
LB-1	0.5	Waccamaw River
MB-2	0.4	ICWW

4. WATER QUALITY

(1) Surface Water

The two major surface water bodies in the Grand Strand area under study are the Waccamaw River and the Intracoastal Waterway. Most of the Intracoastal Waterway was formed by dredging Little River, which flows northeasterly, parallel to the coast, and empties into the Atlantic Ocean through Little River Inlet. In the vicinity of Myrtle Beach, the Intracoastal Waterway was constructed by dredging a channel between the Little River and the Waccamaw River. In addition to these two bodies of water, water quality has been of concern as a result of certain closed shellfishing areas, and potential contamination of some beach waters. A summary of the water quality status for each of the above four areas is presented in the following sections:

(A) Waccamaw River

The fresh water reaches of the Waccamaw River have been classified as Class A, by the South Carolina Pollution Control Authority. Class A Standards require that fecal coliforms must not exceed a geometric mean of 200 counts per 100 ml, and that the dissolved oxygen must not be less than 5 mg/l. These standards are not met at a number of sampling stations along the river but South Carolina Water Classification Standards state that standards will not be considered violated when values outside the established limits are caused by natural conditions.

This appears to be the case for the ICWW. There is a reason to believe that the entire stretch of the river from Conway to a point about one mile below the confluence with the Intracoastal Waterway does not meet Class A standards. The primary municipal contributor would be Conway which is outside the planning area.

(B) Intracoastal Water

The ICWW from the North Carolina state line to the saltwater line within Georgetown County is classified as Class A. Field studies in April and August 1972 showed that total and fecal coliform density exceeded standards as a result of municipal plant waste discharges into the waterway. The largest waste discharge originated with the Lower Myrtle Beach oxidation pond (See Chapter I Section 5 in the Draft EIS.)

(C) Shellfishing Areas

Shellfishing has been closed in the areas of Pawley's Island, Litchfield Beach, Little River Estuary, Cherry Grove Inlet, Midway Inlet, Parsonage Creek, and Winyah Bay. Murrell's Inlet is open on a conditional basis. These areas have been closed as a result of discharges from oxidation ponds, treatment plants, inadequate or malfunctioning septic tanks, and urban runoff.

(D) Beach Waters

The bacterial quality of the majority of the bathing beach waters sampled by the Environmental Protection Agency in September 1972 was within the recommended South Carolina standards for primary contact recreation. Approximately half of the stations sampled were in violation of the Class SA bacterial standard, as a result of creeks and washes discharging to beach areas, as well as the discharge of effluent from some existing waste treatment facilities.

(2) Ground Water

In the Grand Strand-Conway area north of Little River, the water table aquifer furnishes water for most domestic supplies.

Chemical analysis of this water indicates conformance to U.S. Public Health Service drinking water standards except for natural iron concentrations.

The principal aquifer in the area, the Pee Dee-Black Creek aquifer--lies beneath the water table aquifer. All municipalities, as well as many small industries and naval bases, in the area draw their supplies from this aquifer. This water conforms to drinking water standards except for excess flouride and chloride content in several wells.

Almost all the recharge of the water table aquifer is from local precipitation. From there it moves to discharge points such as wells, streams, lakes, waterways and the ocean. Near areas of heavy pumping from the Pee Dee-Black Creek aquifer, water leaks slowly from the water table into the Pee Dee-Black Creek aquifer.

Salt water intrusion into the Pee Dee-Black Creek aquifer does not appear to be occurring.

5. HISTORICAL ARCHEOLOGICAL AND RECREATIONAL RESOURCES

(1) Historical Sites

The planning area contains several types of historical sites including plantation, historic churches and cemetaries, houses of architectural significance, and Revolutionary and Civil War sites. Several of these properties known as the Pawleys are included in the National Register of Historic Places. Hobcaw Barony and Arcadia Plantation are under review for nomination for inclusion in the National Register.Other sites within Brookgreen Gardens, but outside the 201 planning area, are pending National Register approval.

(2) Archeological Sites

There are several identified archeological sites in the vicinity of the proposed facilities. In designing the facilities, these sites were taken into consideration so that they are not in the path of any proposed transmission lines. Since detailed surface investigations have not been made for much of the land, the planning area contains other archeological sites.

(3) Recreational Resources

Natural areas such as the beach, ocean, bays, inlets and rivers, state parks and game management areas are popular recreational sites. Huntington State Beach Park and Myrtle Beach State Park are the major public facilities. Golf courses and tennis facilities supplement the natural areas. Bathing, tennis, boating, fishing, camping, golfing, and hunting are the principal recreational activities.

6. COMMUNITY FACILITIES AND SERVICES

A combination of state, county and municipal agencies provide community services in the planning area. In general, state and county agencies provide health, welfare, educational, and highway services. The municipalities and counties share water supply, wastewater treatment, public safety, solid waste treatment, and administrative services. The major areas of community facilities and services in, or available to, the Grand Strand area are summarized below:

(1) Medical Services and Public Health. Two hospitals and a nursing center are located in Horry County but serve the general population in the two county area. The year round population contains 60 medical doctors and 20 dentists. The County Health Department is responsible for public health issues that include inspection of commercial kitchens, water supplies, dairies, and the installation of septic tanks, package plant systems and other waste disposal systems. The County Health Departments are agents of the State DHEC.

(2) Law Enforcement. Law enforcement activities are managed by a Sheriff at the county level and by a Chief of Police at the municipal level. Manpower is concentrated at the municipal level with a moderate amount of technical equipment support. The law forces utilize full and parttime staff to accommodate

the peak season populations.

(3) Fire Protection The municipal fire departments are staffed by both full time and volunteer firemen. Myrtle Beach has the largest number of firemen with 29 full time and 25 volunteers. It operates two stations and several types of equipment to meet the firefighting needs of high rise, high density development.

(4) Education In addition to public schools, the area has technical education, college, and university facilities. The Horry-Georgetown Technical Education Center is a post high school facility offering many degrees. Although the goal of the Center is to assist adults in obtaining immediate employment, many of the degrees can be transferred to four-year college programs. The curricula are geared to attracting and assisting industrial firms in the area. The Coastal Carolina Regional Campus, of the University of South Carolina, located between Conway and Myrtle Beach, offers a variety of two and four-year programs.

(5) Transportation While approximately 98 percent of all tourists arrive by car, the expansion of highway capacity has not kept pace with the area's growth. The major access roads are:

(A) U.S. Route 17 which parallels the beach

(B) U.S. Route 501 which connects Route 17 to Interstate 95 for access from the north

(C) U.S. Route 378 which connects I-95 to Route 501 at Conway for access from the south

(D) South Carolina Routes 9 and 917 which provide access to the northern end of the Grand Strand.

Access by air is provided at Myrtle Beach Airport (MBA), located next to the Intracoastal Waterway near Crescent Beach, and at Myrtle Beach Air Force Base (MBAFB). Commercial jet service to MBAFB was initiated in July 1975. MBA will be used increasingly for general aviation and should be expanded in the near future to meet increased service demands.

C. SUMMARY OF ALTERNATIVES ANALYSIS AND THE PROPOSED ACTION

1. USE OF SEPTIC TANKS AND PACKAGE PLANTS

The 201 facilities plan analysis of existing wastewater treatment facilities determined that five municipal plants plus several package plants were suitable for incorporation into the new plan. All other public, semipublic, and private plants should be phased out as soon as new regional facilities are available because of previously discussed water quality problems and potential health hazards.

2. EFFLUENT DISPOSAL AND ITS RELATION TO TREATMENT LEVEL

The two primary alternatives for disposal and/or reuse of wastewater treatment effluent were discharge to the Intracoastal Waterway and Waccamaw River, and spray irrigation with associated distribution systems. Computer results indicated that secondary treatment for discharges up to 6.0MGD is adequate for disposal into the Waccamaw River below the confluence point with the Intracoastal Waterway. However, tertiary treatment is required for any discharge into the Intracoastal Waterway and total discharges may be limited to 6.0MGD. It was also determined that secondary treatment is adequate for discharge of effluent from a single regional treatment facility, if the effluent is discharged to the Waccamaw River below the confluence with the

Pee Dee River.

To determine the feasibility and the economics of applying effluents to the land, studies were conducted to determine soil characteristics in the study area, as well as anticipated effluent characteristics, percolation rates, and possible irrigation sites. It was concluded that because of a seasonal high water table in most soil types, land application could not be utilized on a year round basis. Therefore, in order to dispose of effluent on land, an alternative effluent disposal system would have to be used when the water table is high. Since a higher treatment plant standard would be needed to meet effluent requirements during this period, land disposal was rejected as a viable alternative.

3. COMPARISON OF WASTEWATER TREATMENT FACILITY ALTERNATIVES AND PLAN SELECTION

Because of the large area encompassed by the facilities plan, four regional wastewater treatment plant concepts were proposed as alternatives. Each of the regional plants' alternatives integrated various combinations of existing and usable wastewater treatment facilities. A total of 13 basic potential regional wastewater treatment plant configurations were identified for the four conceptual alternatives. These treatment alternatives were compared in terms of present worth and annual equivalent costs and the results are shown in Table 4-7 in Chapter 4 in the Draft EIS.

The initial analysis of the above 13 alternatives resulted in the selection of Alternative 9 as the proposed action. Alternative 9 involves the construction of three regional wastewater plants, A, C, and G, in addition to the continued use of the existing plants, MB-1, NMB-1, NMB-2, AF-1, and LB-1. All existing plants except MB-1 were to be phased out by 1982. However, as a condition of the November 21, 1975 approval of the Grand Strand facilities plan, the South Carolina Department of Health and Environmental Control required the analysis of seven additional alternatives affecting the north and central service areas. These seven alternatives are as follows:

(1) Discharge existing plant MB-1 and north plant A into the Intracoastal Waterway, with a treatment level of 10 ppm BOD5 and suspended solids, and 2 ppm ammonia.

(2) Utilize existing plant MB-1 effluent for land spreading and discharge north plant A effluent into the Intracoastal Waterway with the same treatment as above.

(3) Utilize north plant A effluent for public land spreading and discharge existing plant MB-1 into the Intracoastal Waterway.

(4) Utilize existing plant MB-1 effluent for land application and discharge north plant A effluent into the Intracoastal Waterway.

(5) Utilize north plant A for rural land application with 85 percent BOD_5 and SS removals, and discharge existing plant MB-1 into the Intracoastal Waterway.

(6) Utilize existing MB-1 and north plant A for effluent rural land application.

(7) Transfer the maximum practical untreated effluent from the north plant A and existing plant MB-1 to the central plant C for discharge into the Waccamaw River.

A comparison of capital and annual O&M costs for these seven new alternatives is summarized in Table 4-13 in Chapter 4 of the DEIS. This table indicates that Alternative I which is essentially the same as Alternative 9 of the original 13 is the lowest in capital costs; Alternative V is the second lowest. Therefore, Alternatives I and V were considered further in the facilities plan supplementary engineering report. Given these two choices, Alternative I was selected because of the determination that a seasonally high water table throughout most of the area would preclude the land application of effluent on a large scale.

Following the publication of the Draft EIS, modeling work done on the ICWW as part of the 208 planning effort was released indicating a need for stringent control of wastewater discharges. In addition the design year flow of plant MB-1 was increased from 9 MGD to 12.0 MGD.

Based on this new information, the South Carolina Department of Health and Environmental Control recommended the following waste loads and conditions for discharge into the ICWW:

(1) Plant A: 10mg/l BOD_5, 2 mg/l ammonia, discharge at 6 mgd.

(2) MB-1: No discharge at present site.

(3) Plant G at discharge point described in Draft EIS: 7 mgd of secondary effluent or a maximum allowable discharge of 6400 lbs/UOD/day.

(4) Plant G and MB-1 with discharge point at Node 48 of ICWW Model: 20 mgd at secondary treatment of 30 mg/l BOD_5.

Given this new information it was deemed most cost effective and environmentally sound to move the discharge point for both Plant G and Plant MB-1 to Node 48 to allow for discharge at secondary treatment. Both plant sites will remain at their present locations.

Table 1 presents the phasing of the proposed project and Figure 1 presents a map of the proposed system.

Table 1
Phasing of Proposed Action

	WWTP's	WWTP Discharge	Treatment Required	Design Capacity	Capital Costs $1,000	O & M Costs $1,000
Phase I (1978-1982)	A	ICWW	S+N+F	6.0	8,398	1,052
	C(1)	Wacc.R.	S	2.8	4,817	149
	G	Wacc.R.	S	6.0	13,507	343
	MB-1	Wacc.R.	S	12.0	17,088	700
	NMB-1(2)					
	NMB-2(2)	ICWW	OP+F	1.2		
	AF-1(2)					
Phase II (1982-1987)	A	ICWW	S+N+F	6.0(3)	(3)	1,052
	C	Wacc.R.	S	2.8	1,264	232
	G	Wacc.R.	S	6.0	5,461	343
	MB-1	Wacc.R.	S	12.0	0	700
Phase III (1987-1997)	A	ICWW	S+N+F	6.0(3)	(3)	1,052
	C	Wacc.R.	S	2.8	695	314
	G	Wacc.R.	S	7.5	3,225	656
	MB-1	Wacc.R.	S	12.0	0	700

Legend

(1) Plant C incorporates LB-1
(2) Plant phased out
(3) Cannot expand Plant A beyond 6 MGD due to water quality limits
ICWW - Intracoastal Waterway
Wacc.R. - Waccamaw River
S - Secondary treatment (30 mg/1 BOD_5 & SS)
S+N+F - Secondary treatment plus nitrification plus filtration
(10 mg/1 BOD_5, 2 mg/1 ammonia, and 5 mg/1 effluent DO)
OP+F - Oxidation pond plus filtration
T - Trickling filter

Figure 1

Map of Proposed Project

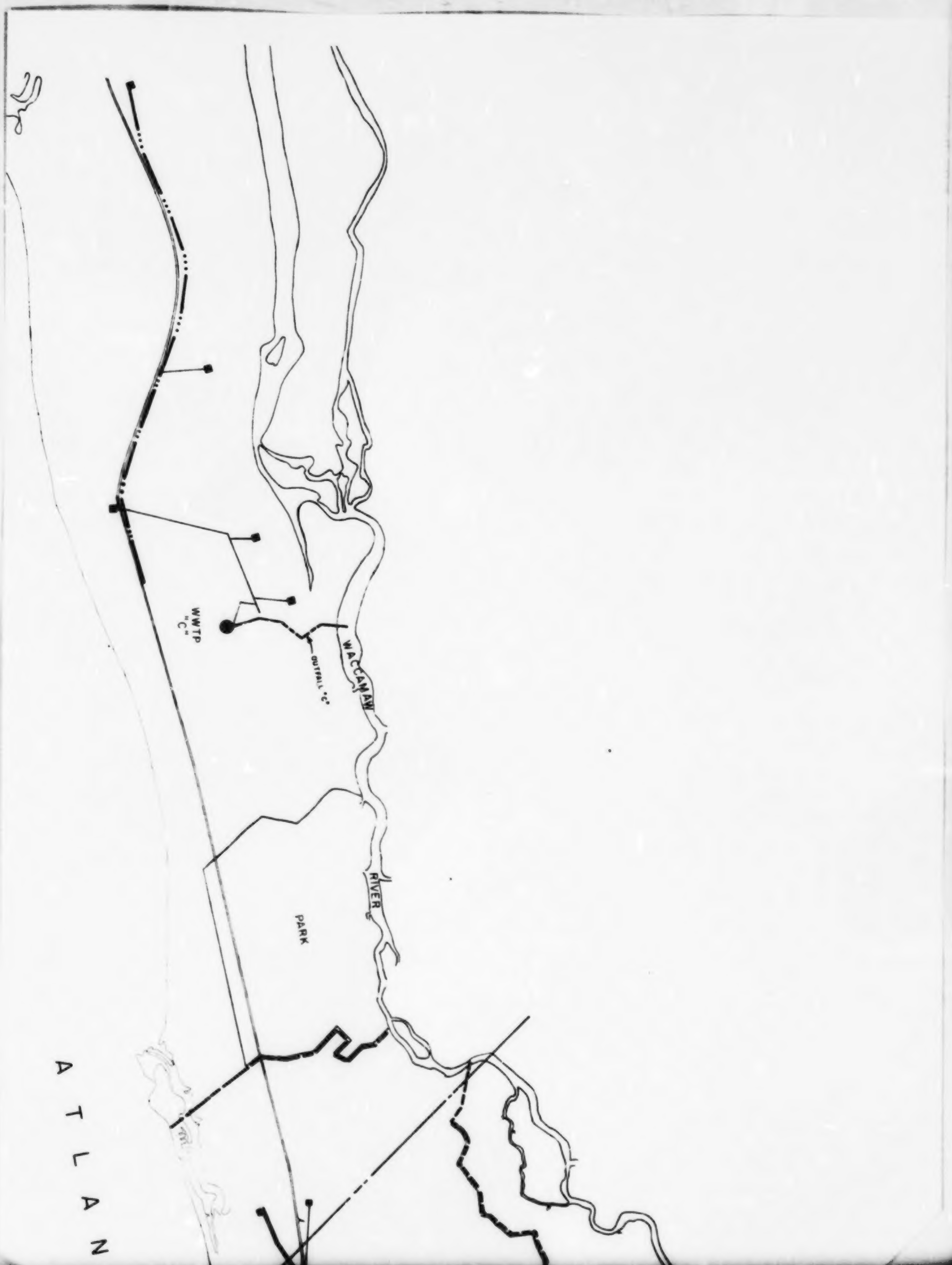
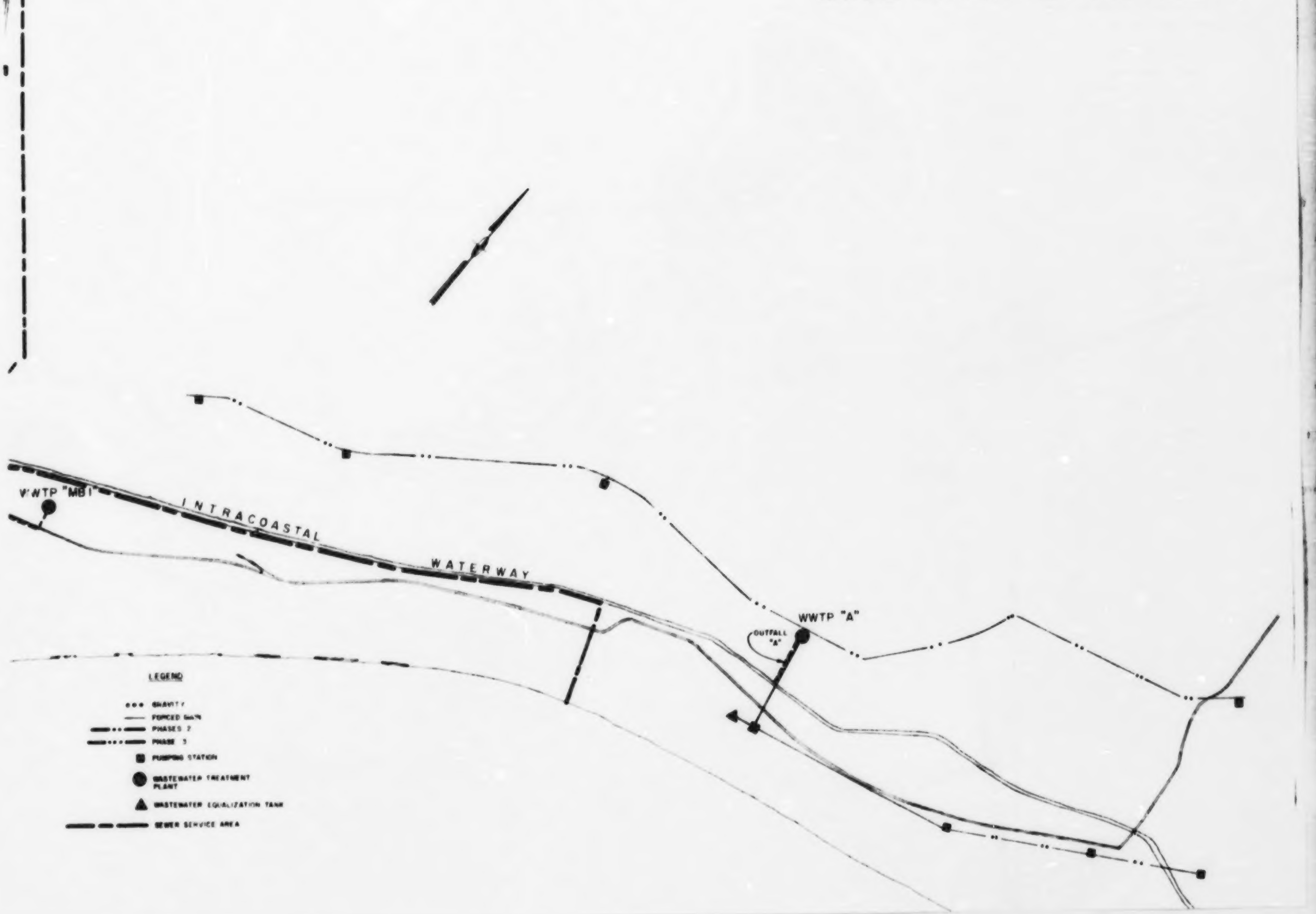

WWTP "C"
OUTFALL "C"
WACCAMAW
RIVER
PARK
ATLAN

FIGURE 1

GRAND STRAND SERVICE AREA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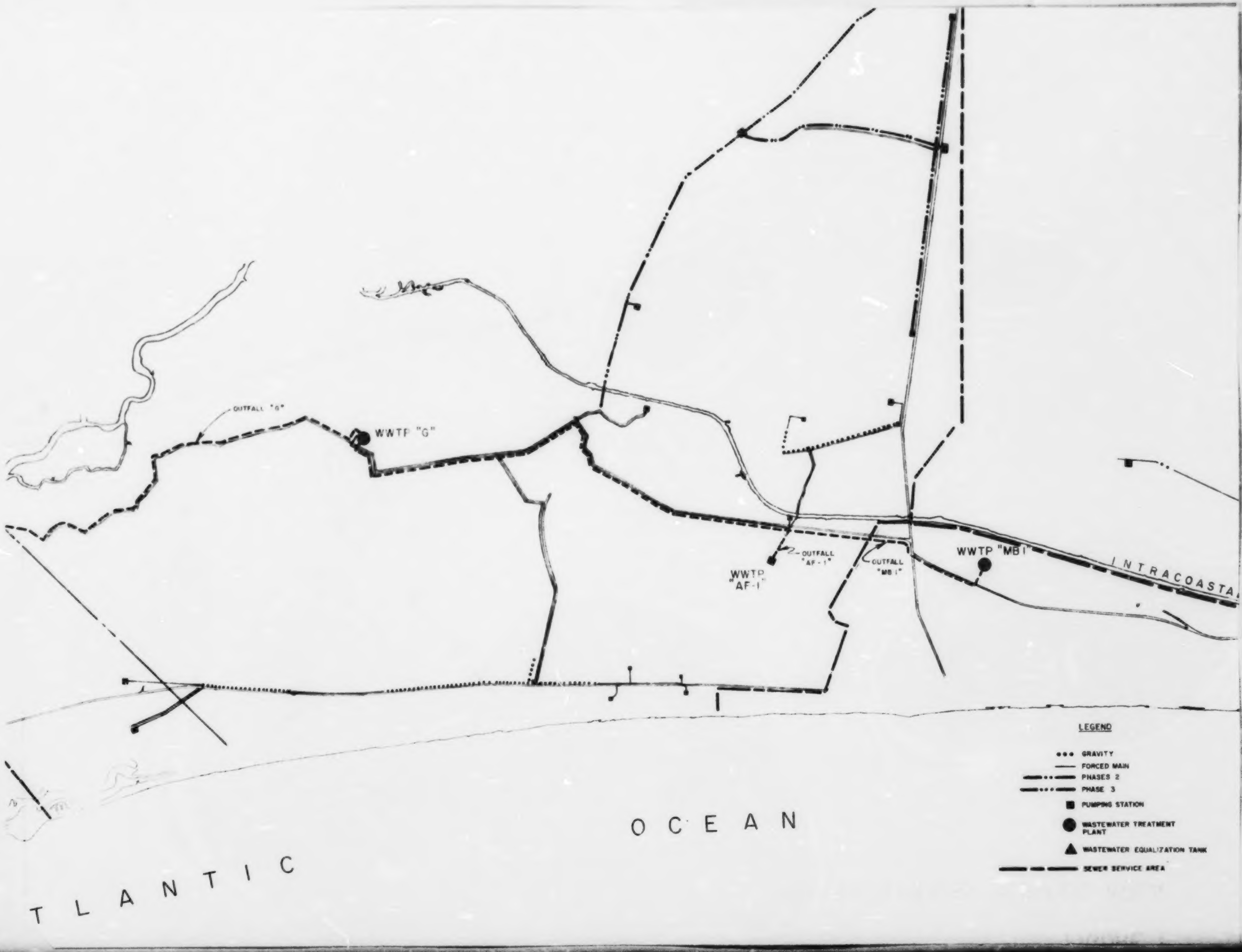
INTRACOASTAL
WATERWAY
WWTP "A"
OUTFALL "A"
LEGEND
GRAVITY
FORCED MAIN
PHASES 2
PHASE 3
PUMPING STATION
WASTEWATER TREATMENT PLANT
WASTEWATER EQUALIZATION TANK
SEWER SERVICE AREA


OUTFALL "G"
WWTP "G"
WWTP "AF-1"
OUTFALL "AF-1"
OUTFALL "MB1"
WWTP "MB1"
INTRACOASTA
TLANTIC
OCEAN
LEGEND
GRAVITY
FORCED MAIN
PHASES 2
PHASE 3
PUMPING STATION
WASTEWATER TREATMENT PLANT
WASTEWATER EQUALIZATION TANK
SEWER SERVICE AREA

D. PRINICPAL FINDINGS AND CONCLUSIONS

1. WATER QUALITY

(1) Shellfish Areas

It can be expected that with one exception all closed shellfish areas can be opened as septic tanks and package plants are phased out and as new central sewage plants are constructed. The one exception appears to be Winyah Bay, where preliminary analysis by the South Carolina Department of Health and Environmental Control indicated that the primary pollution sources are industrial. Resolution of this industrial point source problem will require further study.

(2) Intracoastal Waterway

Although considerable water quality modeling of the Intracoasttal Waterway has been conducted, the validity of indicated results is still somewhat questionable because of the limited water quality data. Nevertheless it can be stated that improvement in water quality in the Intracoastal Waterway can be expected as a result of the significant reductions of discharges from municipal wastewater treatment plants. It appears, however, that water quality criteria may not be achieved as a result of natural conditions in the waterway. The State's new waste load allocations based upon the latest 208 model are presented in Appendix I.

(3) Waccamaw River

There is reason to believe that the River from Conway to a point about 1 mile below the confluence with the ICWW does not meet Class A standards. The most probable cause is the municipal discharge from Conway which is outside the planning area. Improvements in the water quality below the confluence with the ICWW can be expected as a result of implementation of the plan.

(4) Beaches

Beaches in the area currently meet the South Carolina State contact standards, and general bacterial levels can be expected to improve gradually as the wastewater treatment plan is implemented. Nonpoint source controls, which are the subject of the current areawide wastewater planning effort, should result in further improvements to the beach areas.

2. TREATMENT SYSTEM CONFIGURATION

The final selection of a four-plant layout appears to be a cost-effective solution to the general wastewater treatment problems of the Grand Strand area. Secondary treatment in plants C and G and MB-1, and tertiary treatment for plant A, meet South Carolina State point source regulations. Further analysis of effluent land disposal is recommended especially with the anticipated addition of many new golf courses.

3. SLUDGE DISPOSAL

In Phase I, sludge disposal by drying and offering the sludge to local golf courses appears sound. However, sludge volumes will increase significantly during Phases II and III; further consideration should be given to direct spraying of digested sludge and development of a sod farm and nursery utilizing liquid sludge, as proposed in the Facilities Plan.

4. PROJECTED GROWTH

In reviewing the permanent population projections, the EIS study compiled and examined an EPA estimate (1972), a LBC&W estimate (1972), and a Waccamaw Regional Planning and Development Council (1974) study. The analysis showed that both EPA and LBC&W had relied heavily on historical trend data, and WRPDC study had focused on recent trends. As a result of the EIS analysis, both the short and long term growth trends were revised downward. For 1972-1977 period, the WRPDC population projection was 40,702 for the permanent population, and 292,748 for the summer population. The revised estimate for that period is 38,000 for the permanent population, and 290,046 for the summer population. The WRPDC estimate for 1997 was 149,641 permanent residents and 634,210 summer residents. The EIS projections are for 103,175 permanent residents and 498,418 summer residents.

5. SECONDARY IMPACTS RESULTING FROM GROWTH

(1) Impacts on Community Services From Population Growth Will be Similar under the Proposed Action or the No Action Alternative.

Population growth will continue under either the proposed action or the no action alternative. The revision of WRPDC population estimates assumes that oceanfront property will be fully developed by 1990 and that even at the revised projected growth rate the area will rapidly reach its density saturation. This growth will be sufficient to produce a demand for additional community services and facilities with specialized orientation according to the relative proportions of growth of the discrete populations in the areas. Pressure on the transportation network should continue, as the existing highway capacity has not kept pace with area growth. A need for limited bus service may well emerge to serve both elderly and tourist populations.

(2) Significant Impacts to Community Services will Result From Projected Growth

Few guidelines and standards exist which specify the level of services required in communities of different sizes. The requirements of each community will vary on the basis of its unique set of characteristics, of which size is only one. Communities can evaluate and project the adequacy and availability of services and facilities by considering:

(A) Population level

(B) Density

(C) Development patterns and land use

(D) Existing excess or deficiency of classroom, hospital and other facility capacity

(E) Population age characteristics

(F) Population income characteristics.

Specifically, for the population increase from current levels to those projected for 1997, significant increases in the requirements for the following community services can be expected:

(A) Schools

(B) Hospital beds

(C) Administrative facilities

(D) Police personnel and equipment

(E) Fire protection personnel and equipment

(F) Employment counseling

(G) Transportation.

(3) Impacts From the Pattern of Growth Will Vary Under the Proposed Action or No Action Alternative

The no action alternative will tend to favor large-scale projects of either low density single-family residences or high density condominium and multi-family complexes. This is because septic tanks are only suitable for single-family homes on fairly large lots, due to poor soil conditions in the area. Moreover, the economics of scale for package plants are such that larger plants are more cost effective on a per unit basis and, thus, more marketable. Fewer but larger plants would also be preferable for quality control and growth management purposes by local jurisdictions.

Under the proposed action, residential growth would continue in a similar fashion. However, there would be a greater flexibility in design and land use plans. Industrial growth would more likely be attracted by central municipal sewerage. Expanded industry would provide a broader, more balanced economic base for the Grand Strand area.

The mix of growth, residential , resort related, or manufacturing, might have an impact on the population median age and income level. Changes in these factors would influence demands on community services. An increase in the retirement age population may require additional health and welfare services. Income levels of the population will affect spending in the area, tax revenues, and therefore, the availability of funds for expanding community services. Wages in the tourism industry are traditionally lower than those in other industries due to the seasonality and lower skill requirements of most tourism jobs.

(4) Under Either Alternative the Principal Concern will be the Management of Growth

Since either alternative will result in continued growth, the principal responsibilty of local authorities is to manage this growth in an orderly way and protect the area's natural resources and water quaity. In recent years, both Horry and Georgetown counties have adopted zoning and subdivision regulations.

Several of the municipalities have similar regulations and have engaged in planning under HUD 701 grants and State of South Carolina grants. Under the no action alternative, growth management should be focused on developing stronger system standards and criteria for septic tank approvals; stringent design and inspection criteria for package plant systems; improved land use controls in the areas currently unzoned; and a process to systematically monitor plant effluent and managment and septic tank malfunctions.

(5) Ecological Impacts of Growth

The projected growth and proposed plans for land development will impact natural vegetation and wildlife. They will deplete the habitats and food resources of Grand Strand wildlife. The wildlife will be limited in its ability to migrate successfully because other forests and vegetative areas have reached their carrying capacity. .

6. IMPACTS TO HISTORIC AND ARCHEOLOGICAL RESOURCES

Archeological and historic surveys are being conducted on all areas which will be subject to direct project impact. An old cemetery was located along the route proposed for the original Plant C outfall line described in the Draft EIS. This site, is described in Appendix G in the DEIS. A 19th century rice mill was located along the route of the Plant C outfall line.

This site is described in Appendix II of the Final EIS. The route for the outfall has been moved to avoid disturbances to this sites.

7. COSTS

The capital and operation and maintenance costs for each phase of the project are shown in Table 1-1. A breakdown of total capital costs for each plant system is shown below:

Plant A = 8.398 million

Plant C = 6.776 Million

Plant G = 22.193 million

Plant MB-1 = 17.088 million

The local share of cost on this project consists of 25 % of construction cost and 100% of operation and maintenance costs. Translating these costs into sewer service charges, the costs for each plant system are as follows:

	Cost/1000 gal.		
Plant + System	Ph 1	Ph 2	Ph. 3
A	$1.12	$1.12	$1.12
C	$0.60	$0.60	$0.60
G	$0.56	$0.68	$0.84
MB-1	$0.52	$0.48	$0.48

Chapter II

ADDITIONS AND REVISIONS TO INFORMATION CONTAINED IN THE DRAFT EIS

A. Bio-disc Treatment Process at Plant G and Relocation of Plant G

In the Draft EIS, an activated sludge system, complete mix, was selected as the treatment process for Plant G. Since the DEIS was published, additional work was done on evaluation of treatment processes including the evaluation of a bio-disc system. This supplementary evaluation was undertaken because of the problems associated with providing treatment facilities for a tourist oriented service area with high fluctuations in wastewater flow. The need to provide for peak flows during the summer months can cause a high degree of underutilization of facilities in the off season and lead to engineering problems in the treatment of waste flows substantially smaller than the treatment plant was designed to handle.

A bio-disc system can be easily designed to work in parallel units to allow for maximum flexibility in operating and maintenance. When waste flows are low, one bio-disc unit may provide all necessary treatment. All units can be brought into operation as the wasteflow approaches the design peak.

The supplementary cost analysis indicated that the bio-disc system was the most cost effective type of treatment process investigated. The Summary Cost Table shows a summary of capital, present worth, and annual equivalent costs.

Table 2
Alternatives Summary Cost Table

Alternative No.	Process Description	Capital Cost Phase II	Capital Cost Phase III	Total Present Worth	Annual Equivalent Cost
1	Diffused Air Activated Sludge	$4,840,044	$1,986,078	$9,051,579	$854,379
2	Bio-disc	$4,676,151	$2,713,534	$7,627,994	$720,008
3	Unox	$4,812,692	$4,658,821	$9,767,244	$921,930
4	Mechanical-Air Activated Sludge	$4,582,190	$1,924,400	$8,850,870	$835,433

Because of the factors discussed, a bio-disc system has been chosen as the method of treatment in Plant G in the Final EIS. The chosen treatment process is the most operationally satisfactory and cost effective system evaluated. Following publication of the DEIS, the location of the proposed treatment plant G was changed from its planned location south of the county road leading from Raccon Run Golf Course to Freewoods to a new location on the north side of the road. The change was made because it was easier to acquire the land north of the road. The new site consists of an open field with no significant vegetation. An archelogical survey of the new site is presented in Appendix II.

B. Increased Flow at Plant MB-1 and Evaluation of Treatment Process

Following publication of the DEIS, new information was developed indicating that the current flow into Plant MB-1 was greater than previously thought. The average daily flow was found to be approximately 8.0 mgd with the exclusion of extraneous flow and direct runoff from the pond. This was an increase of approximately 3 mgd from the flow discussed in the 201 Plan and Draft EIS. This information was developed for the city of Myrtle Beach by consoer, Townsend and Associates in a report entitled "Preliminary Engineering Report on the Expansion of the Myrtle Beach Wastewater Collection and Treatment Systems." EPA has reviewed the report and has found the new information to be accurate. Therefore, the ultimate capacity at Plant MB-1 will be increased from 9 mgd to 12 mgd.

The existing aerobic-faculative lagoon does not have sufficient capacity to provide secondary treatment to the new projected design year flow of 12.0 mgd. Several alternatives were evaluated to provide the additional treatment capacity necessary. The cost analysis conducted is summarized in table III.

TABLE III

ESTIMATED COST OF SECONDARY TREATMENT ALTERNATIVES

(Thousands of Dollars)

	Air Activated Sludge (Surface Aeration)	Air Activated Sludge (Diffused Aeration)	Oxygen Activated Sludge	Activated Bio-Filter	Biodisc	Oxidation Ditch
Estimated Project Cost	$3,150	$3,010	$3,400	$3,250	$3,160	$3,140
Annual Debt Service Cost @ 6-1/8% Interest Over 20 Years	279	266	301	288	280	278
Annual O&M Cost (Power & Maintenance)	68	82	65	75	56	65
Total Annual Cost	$ 347	$ 348	$ 366	$ 363	$ 336	$ 343

Based on this cost comparison, it can be seen that the air activated sludge processes, the bio-disc process and oxidation disc process are similar in total cost. The final decision among these three alternatives was based upon the following considerations:

(1) Flows in the winter months are expected to be approximately 5 mgd lower than the average summertime design flow of 12 mgd. This reduced flow can be treated entirely by the existing aerobic-facultative lagoon. Therefore, substantial savings can be achieved if the selected facilities have the flexibility to operate separately or together without affecting performance.

(2) Land costs are high in the vicinity of the existing site. The oxidation ditch process would require a large tract of land.

(3) Areas surrounding the plant site are expected to develop in a predominantly residential land use pattern; therefore, the selected process must keep odor and noise to a minimum.

Based on these factors the bio-disc system provides the best treatment process with its maximum flexibility and small space requirements. Therefore, use of the activated bio-disc is recommended for the secondary treatment-nitrification process.

C. New Outfalls for Plant C and Plant MB-1 and Limitations on Plant A Discharge

Following completion of the DEIS, some additional modeling work done as part of the 208 study was completed. Based upon this analysis, the South Carolina Department of Health and Environmental Control issued waste load allocations for the ICWW (See Appendix I). These allocations indicated that no discharge would be allowed at the existing Plant MB-1 location and that Plant A would be limited to a discharge of 6.0 MGD.

This allocation will carry Plant A through Phase One. Alternative methods of discharge must be found for Phase Two and Three.

Since no discharge will be allowed for Plant MB-1 in the ICWW, a force main and outfall must be constructed to the Waccamaw for discharge (See Figure 1). The point chosen for the outfall can take 20 MGD of secondary treated wastewater. Since this location is suitable for the design year flows of Plant C as well as Plant MB-1, the discharge point for Plant C will also be moved to the new site where discharges from both plants will flow through a joint outfall. Therefore, secondary treatment will be sufficient for both plants through the design period.

D. Design Capacity for Plant C

The design capacity and costs for Plant C were printed incorrectly on Table 5-1 in the DEIS. The numbers presented in the Draft were based upon the figures presented in the 201 Plan before the population projections were reduced. The new design year flow is 2.8 MGD. Because of the decrease in size of the facility, it was found to be most cost effective to build for the design period in Phase One rather than to have a three phase project as originally proposed. The new cost figures are presented in Table 1.

E. Sludge Disposal Analysis

Four methods of sludge disposal were evaluated for use in the Grand Strand 201 area. These methods were the following:

A. Disposal by land-spreading of liquid or dried sludge

B. Disposal by landfill of liquid or dried sludge

C. Disposal by incineration

D. Disposal by marketing (pelletization)

Method A was selected because of the availability of timberland which could absorb the sludge in either liquid

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or dried form while at the same time minimizing waste and protecting the ground water table.

Method B was eliminated due to its uncertainty as a long-term disposal method in the area. Methods C and D were rejected due to high cost and uncertainty related to disposal of process residues.

Negotiations are now in progress for the lease and/or purchase of timberland for the disposal of liquid anaerobically digested sludge. 30,000 acres of timberland (damaged by fire) has already been located which could accommodate sludge disposal for Plant C long beyond the design period. Approval by SCDHEC's Director of Solid Waste will be obtained after the specific disposal site has been identified. No grant for project construction will be given until a contract has been signed for use of a particular site and approval has been received from the Director of Solid Waste. Solid Waste approval has been received.

Characteristics of the sludge are projected as follows:

Nitrogen, as N (dry wt. basis)	40-60 mg/g
Total Phosphorus, as P (dry wt. basis)	40-60 mg/g
Potassium	5-10 mg/g
Calcium	5-10 mg/g

Copper	0.1-0.2 mg/g
Iron	0.5-0.6 mg/g
Lead	0.2-0.4 mg/g
Zinc	0.5-1.0 mg/g
Cadmium	0.01-0.015 mg/g
Selenium	0.001-0.005 mg/g
Mercury	Undetectable
PCB	Undetectable
Cyanide	Undetectable

Loading rates on land will be less than 10,000 lbs of dry solids/acre/year.

Human contact will be minimal since forest land will serve as the disposal site. All land used will be restricted for that use only and and will be posted. Potential for pathogenic organism contact will be restricted to the operator and will be less than the potential contact at the treatment plant. All application areas will be impounded or burned to prevent runoff.

The same information must be available for Plant C and Plant A before Step II grants are issued on these projects.

Sludge treatment facilities at Plant MB-1 consist of air flotation thickening of waste sludge, anaerobic digestion of thickened sludge and land application of digested sludge at a site adjacent to the existing plant site. Because sludge cannot be applied on land during wet periods, digested sludge storage tanks are provided in conjunction with the digesters.

The total quantity of digested solids produced per year from MB-1 is estimated to be 475 dry tons for the first year of plant operation and approximately 700 tons during the 1997 design year. Monitoring plans call for analysis of solid ans sludge for fecal coliform, nutrients, heavy metals and pH as required by the South Carolina Department of Health and Environmental Control and EPA.

F. Archeological Surveys

An archeological survey of the sites and outfall lines for Plant A and Plant C and of the site and first phase interceptors for Plant G have been conducted by Dr. reinhold J. Engelmayer. No sites eligible for listing in the National Register of Historic Places or otherwise of national, State or local significance were found in the surveys for the Plant A, G and MB-1 systems. One significant archeological site was located on the proposed route for the outfall from Plant C. On the south side of the roadway leading from the Plantation house to the marina are the remains of a colonial rice mill which was operated by Mr. John Tucker in the 19th Century. This rice mill would be adversely affected by the installation of the outfall line along the south side of the road. The archeologist recommended that this segment of the outfall be moved to the north side of the road. This will be done so no adverse impact will result from project construction.

A description of the surveys now available is presented in Appendix II of the FEIS. An archeological survey on the interceptor system for Plant A and Plant C the force main from Plant MB-1 to Plant G, and the outfall for Plant G will be conducted in the early stages of Step II work.

A condition will be placed on future grants to require approval of all surveys and any mitigation necessary to satisfy the State Historic Preservation Officer, State Archeologist and EPA.

G. Vegetative Surveys

A vegetative survey on the new outfall lines for Plant G and Plant MB-1 is included in Appendix III. No rare or unusually large trees or trees with special historical value were found. A vegetative survey on the interceptor system for Plant A and Plant C and the force main from Plant MB-1 to Plant G will be conducted in the early stages of Step II work. A condition will be placed on future grants to require approval of all surveys and any mitigation necessary to satisfy EPA.

Chapter III

Public Hearing on Draft EIS and EPA Response to Comments and Questions

THE

ENVIRONMENTAL PROTECTION AGENCY PUBLIC HEARING

on

DRAFT ENVIRONMENTAL IMPACT STATEMENT

GRAND STRAND REGION, SOUTH CAROLINA

EPA PROJECT NO. C450381

THE SOUTH CAROLINA PUBLIC MEETING HALL
Myrtle Beach, South Carolina
Monday, April 11, 1977

Fran Phillips, Moderator

This is to certify that the attached proceedings were held as herein appears, and that this is the original transcript thereof for the file of the Environmental Protection Agency.

Reporter
WHITE'S PROFESSIONAL SECRETARIAL
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THE

PROCEEDING

Moderator: May I call the meeting to order, please? Good evening, and welcome to this public hearing on the Draft Environmental Impact Statement for the Grand Strand Region, South Carolina Wastewater Treatment Facilities. The National Environmental Policy Act of 1969 requires an agency of the federal government to prepare an Environmental Impact Statement whenever that agency proposes to take a federal action significantly affecting the quality of the human environment. The Grand Strand Water and Sewer Authority applied for a grant from the Environmental Protection Agency to construct wastewater treatment facilities for the Grand Strand area of Horry and Georgetown Counties in South Carolina. EPA, responding to the mandate of the National Environmental Policy Act, determined that the issuance of funds for the proposed wastewater treatment facilities was a major federal action significantly affecting the quality of the human environment. Accordingly, on February 5, 1975, EPA issued a notice of intent to prepare an Environmental Impact Statement. This public hearing is being held pursuant to the guidelines of the Council of Environmental Quality and the rules and regulations of the Environmental Protection Agency with regard to the preparation of the Environmental Impact Statements. The purpose of the public hearing is to receive comments from the public on the

Draft Environmental Impact Statement. This Draft is being discussed in a public forum to encourage full participation of the public in the decision making process, to develop greater responsiveness of governmental action to the public's concerns and priorities, and to develop improved public understanding of projects funded with federal and state funds. An official report of these proceedings will be made and become a part of the record. Notice of the public hearing was published in the Sun News on March 18, 1977, and April 8, 1977; in the Charleston News and Courier on March 18, 1977, and April 8, 1977; and in the Columbia State on March 18, 1977, and April 8, 1977. The Draft Environmental Impact Statement was submitted to the Council of Environmental Quality and made available to the public on February 28, 1977. I would now like to introduce the hearing panel. To my right and to your left, we have not Mr. Swartz, but Bob King of the South Carolina Department of Health and Environmental Control. Next to me is Mr. Joe Fransmathis, he's the Director of the Water Division, EPA, Region IV. And, to your right and my left, Mr. John Hagan, Chief of the Environmental Impact Statement Branch, EPA, Region IV. And I am Fran Phillips, Regional Council for Region IV, Environmental Protection Agency. Some people I would also like to introduce, whose not a part of the hearing panel are: Mr. Bob Cooper, EPA Project Officer for the preparation of the EIS (Environmental Impact Statement). Bob, where are you? Would you raise your hand? Okay... fine. Mr. George White, Chief of the South Carolina State Section, EPA, Region IV. In the back. Sally Shaver, with EPA. Where's Sally? Okay. Christine Beachy. She's the one out in the hall taking names, Assistant Regional Council. We also have Barry Harmon from the South Carolina Department of Health and Environmental Control, with us. Mr. Harry Lockwood, Executive Director of the Grand Strand Water and Sewer Authority, is here. And, Mr. Julian Richardson, Chairman of the County Council, Horry County, is here.... Have I not introduced any elected official that wishes to be recognized at this time? (Pause) Fine, I'll continue. Before we begin citizen testimony, Mr. Bob Cooper who I introduced as the EPA Project Officer for preparation of this Environmental Impact Statement, will give us a brief summary of the Project, to date.

Speaker Bob Cooper: Thank you, Fran. For the benefit of the court reporter, I'll be talking from a prepared statement. The Draft Environmental Impact Statement addresses alternatives for the treatment and disposal of municipal wastewater generated in the Grand Strand Region of South Carolina. The objectives of constructing these treatment and disposal facilities are: The attainment and preservation of high-quality waters for recreational, fish and wildlife, and aesthetic uses, and the provision of treatment facilities to adequately service existing and future sources of wastewater. A 201 Facilities Plan was prepared to develop facilities to meet these objectives. This plan recommended a regional system consisting of three new plants with the continued operation of Plant MB-1 throughout the twenty-year planning period. The total cost of this system was projected to be approximately $78 million dollars. Due to concerns related to population projections and growth related impacts, the Environmental Protection Agency issued a Notice of Intent to prepare an Environmental Impact Statement. The objectives of the impact statement were to evaluate population projections; to evaluate all reasonable alternatives for meeting project objectives; to inform the public of the environmental consequences of these alternatives; and, to form a basis for future decisions on federal funding. As a result of the impact statement evaluation the total peak-day population for 1997 design year is decreased from approximately six hundred and thirty thousand (630,000) to four hundred and ninety-eight thousand (498,000). This change did not affect the plant configurations developed in the 201 Plan. It did, however, result in a decrease in the total projected flow from about fifty (50) million gallons per day, to about thirty (30) million gallons per day. And, a decrease in total project cost to approximately $48 million dollars. The proposed system is designed to be implemented in three phases. In Phase One, ending in 1982, three (3) new regional treatment plants, Plant A, Plant G and Plant C, will be constructed. Plant A will be located on a seventy-two (72) acre site, across the Intra-Coastal Waterway from the Myrtle Beach Airport. Plant G will be located on a twenty-five (25) acre site, near Route 544 Southwest of Socastee. Plant C will be located on an eleven (11) acre site, at the site of the existing Plant LB-1, near the Litchfield County Club. Existing Plant MB-1 will be up-graded and expanded at its present site. Existing Plants NMB-1, NMB-2 and AF-1 will be phased out. Existing Plant LB-1 will be incorporated into Plant C. In the second phase of the project, ending in 1987, all existing plants, except MB-1, will be phased out. Periodic expansion and process up-grading will be required during Phase III, ending in 1997, as the flows increase. The Draft Impact Statement projects the following design capacity for the 1997 design year: Plant A, ten (10) million gallons per day; Plant G, seven point five (7.5) million gallons per day; Plant C, four point eight (4.8) million gallons per day; Plant MB-1, nine (9) million gallons per day. Other major changes occuring during the preparation of the EIS were a result of modeling work done by EPA. Plant A and Plant MB-1 will require nitrification, plus filtration in Phase I, rather than just secondary treatment as it was originally proposed. The outfall line for Plant G had to be relocated to allow for secondary treatment during Phase I. Only Plant C remained at secondary treatment throughout the design period. The major environmental effects of the proposed action may be summarized as follows: One, the alleviation of existing adverse conditions caused by low quality wastewater discharges. Two, the provision of wastewater treatment facilities to accommodate existing and future sources of wastewater. And, three, the allowance for orderly growth in the Grand Strand area. Thank you.

Moderator: Thank you Bob. The procedures for receiving public comments will be as follows. Everyone that's registered to speak will be given an opportunity to be heard. We will hear from speakers in the order of registration. If you wish to speak and have not registered, I would ask you to register as soon as I have completed the recitation of the current procedures. We will ask you to limit your remarks to ten (10) minutes. You may have additional time after everyone desiring to speak has had an opportunity to be heard. I will ask Bob Cooper to stand, signaling that you have used eight (8) minutes of your time. You're welcome to submit any written statements of any length, and the record will remain open for fifteen (15) days for this purpose. There will be no questions to the panel from the speaker. You may submit questions, however, in writing which will be answered in the final Environmental Impact Statement. I reserve the authority to ask you to limit your remarks to relevant issues, and I will ask you to submit your statements in writing if these remarks are not so limited. Formal- formal rules of evidence will not apply here. There will be no oath of witnesses. There will be no cross-examination or direct questions to the speakers. However, if there is a point that needs clarifying or data is submitted that needs further documentation, I will ask one of the members of the panel to address a question to the speaker for purposes of clarification only. There will be no questions by the audience of any persons who make statements here. If you wish to rebut any statements that have been made, either register to speak again, or submit rebuttal in writing. When you are called on to speak, please present a copy of your written statement, if you have one, to the court reporter and another copy to us. Then come and stand at the speaker's podium, give your name and address, and the title or group of which you are associated, if any. If you wish to speak and have not registered, you may do so at this time. Otherwise, we are ready to begin. Our first speaker is Mr. Julian Richardson.

Speaker Julian Richardson: Good evening, ladies and gentlemen, and members of the panel. I'm Julian Richardson, Chairman of Horry County Council. On behalf of the Horry County Council, I would like to publicly take this opportunity to thank the Grand Strand Water and Sewer Authority and the many others who contributed during the preparation of the Grand Strand 201 Facilities Plan. Before this effort was initiated, there was a serious water pollution problem and potential health hazard on the Grand Strand. But, through the efforts extended during the 201 planning process, a program to correct existing pollution problems, potential health hazards, and prevent others has been initiated. The Horry County Council would like to go on record urging the rapid implementation of the Water Pollution Control Projects recommended in the 201 Plan. I thank you on behalf of the County for allowing me to comment.

Moderator: Thank you, Mr. Richardson. Our next speaker will be Mr. John F. Hodges.

Speaker John Hodges: Good evening. My name is John Hodges, Engineering and Construction Manager for the Grand Strand Water and Sewer Authority. The Authority welcomes this opportunity to present this statement tonight. During the three and a half years since the 201 Facilities planning process began much progress has been made in water pollution control in the Grand Strand Region. The Grand Strand Water and Sewer Authority was the lead agency in this effort but success was achieved through the help of many others. The progress made to date is a result of cooperation exhibited by the many: The Cities of Myrtle Beach, North Myrtle Beach and Surfside Beach; Horry and Georgetown Counties; The Georgetown Water and Sewer District, The Waccamaw Regional Planning and Development Council, the South Carolina Department of Health and Environmental Control; and, the Environmental Protection Agency; and, of course, most of all, the citizens of the area. The results of this effort is an economical program of collection and treatment of wastewater in the Grand Strand area. The initial phases of this program are underway now with the design of the Central Wastewater Treatment Plant which will serve the area from the Myrtle Beach Air Force Base, down the coast to Murrells Inlet and as far inland as the Coastal Carolina College. This effort is underway now because of a superlative effort by the South Carolina Department of Health and Environmental Control and the Environmental Protection Agency to get this project underway prior to completion of the Environmental Impact Statement. We have made a great deal of progress during the last few years, but we have a long way to go. With the strong spirit of cooperation exhibited during the past, this effort promises to be equally successful. On behalf of the Grand Strand Water and Sewer Authority, I would like to express our sincere appreciation to all those who have assisted in the 201 Facilities Planning effort and say that we also look forward to a future of continued cooperation. Thank you.

Moderator: Thank you, Mr. Hodges. Our next speaker will be Mr. Douglas P. Windell, City Manager.

Speaker Douglas Windell: Thank you, Fran. Prior to going into my semi-prepared statement, I would like to present another statement. The City of North Myrtle Beach does endorse the regional concept. The one primary concern we do have is about the cost effectiveness of such a proposal. If it can prove to be cost effective, we intend to endorse it one hundred (100%) percent. There are several items in the EIS and the 201 Plan that is of concern to us, and we would like to bring attention to these particular aspects at this point in time. It always seems like you dwell upon the negative on these statements, and I think, for the most part, you assume you endorse everything else, and I think that's the position that we find ourselves in today. The first item, you've heard recently that there has been some adjustments in concepts in reference to the service area involved. For example, MB-1 is being projected now as possibly going to 12-MGD.

This gives us considerable concern, for this would result in substantial increase capacity in the MB-1. Primarily, I assume, because of the I&I problem, that Myrtle Beach system, and also due to the permanent inclusion of certain areas in the outskirts. Such as the environ system. The city would like to go on record... the City of North Myrtle Beach, that the foundation of the 201 Plan and the EIS will be altered, creating a situation which would require a complete review and re-evaluation of all the alternatives, if this does go through. The expected result of this change would be... proposed plan A would become not as cost effective due to it's reduced service area as it pertains to the North Myrtle Beach facility for the duration of the planning period, with provisions for the up-grading. As a result, we think that it's imperative that, especially in the Grand Strand where such staggering cost are included, that the public not be burdened with the projects that are not cost effective. I want to stress the cost effective approach that we're taking. Our second item of concern is the fact that the 201 Plan and the EPA's EIS does not, we don't consider, it adequately reflect the true cost providing adequate sewer-service to the Grand Strand. In the EPA Program Requirements, I think in the Memorandum seventy-six point three dash three (76.3-3) was stated that the EPA policy was the required facility plans to project adequate financial information to enable the public to ascertain their financial obligations. It's reasonable to assume as a result that the same would be required of the EIS written by the EPA, if the 201 Plan does not present this information. In

Section seven point seven (7.7) User Charges were projected, but it was not there that the User Charges presented was taken from a rate study prepared by Black, Crow, and Eidsness in April of 1975. And we've had numerous conversations with Grand Strand on that particular rate study, and I think the Grand Strand realizes that some adjustments are necessary and appropriate. We, as well. But, that rate study was not consistent with the EPA Regulation in that all residents of the Grand Strand were assessed a User Charge to finance all the facilities proposed in the 201 Plan. Well, this means, for example that the residents of North Myrtle Beach would be required to assist in the financing of Plant G, which would not serve them, and is not even in the same municipality. Since the cost per customer determines public support of the project and its resulting feasibility, we believe that it's imperative that the EIS presents the public with a clear representation of the cost of each operable treatment unit, and the financial responsibility of each resident served by that particular operable treatment unit. It is also imperative that the public be informed of how the proposed facility would be funded. EPA Grants, general obligation bonds, or what have you. It has been projected that the monthly service charge would be as much as three hundred (300) to four hundred (400) percent above that shown in the EIS for the service area of proposed Plant G, and we think that's considerable and it needs to be addressed. Our third item, and these aren't as significant as the other items, neither the 201 Plan or the EIS has adequately presented to the public what it would cost to operate and maintain the proposed treatment systems, and of course, this is another big concern of ours. Such things as the cost of energy, man-power requirements, are key elements in the operational, the managing process of the facilities such as presented. Four, no estimate has been made as to the cost of the collective sewers. And we feel this is a vital component to the treatment system, because you have the plant, but if you're going to have to be burdened with the cost of the sewer lines, which could double the cost of the 201 Plan, that it should be brought to the public's attention and they should be addressed and they should be appraised of what this is going to run them. Because it could be a critical aspect as to whether or not they do endorse the 201 Plan implementation. And fifth, we believe that the EIS does go to great length to explain that the growth of the Grand Strand is not and will not be influenced by the availability of sewer facilities as proposed in the 201 Plan. But, we don't believe that this is the case by any means. With increased regulatory requirements for waste treatment and increasing red-tape to obtain NPDES Discharge Permits and construction permits, the development cannot help but be adversely effected. This is especially true considering the fragile environment of the Grand Strand and the increased demands on the EPA and ________________ (this word was indistinguishable) to provide for it's protection. So, in essence, to reiterate my original statement, outside of the primary financial concerns and some adjustments that we've been appraised of as a result of MB-1, we do believe the regional concept is the approach to take, if it can be proven to be cost effective. And, we think there is a delicate balance there, especially with all the various, different plants that we have along those lines, and the approach that we're taking. Thank you for your time.

Moderator: Thank you.

Panelist Hagan: Would you give the reporter a copy of your statement?

Speaker Whipple: It's in rough form and I para-phrased it. I'll have it typed up in final form. I just developed it this afternoon.

Panelist Hagan: Thank you, sir.

Moderator: Our next speaker will be Mr. E. S. Southern.

Speaker E. S. Southern: Members of the Panel. I'm E. S. Southern with the Horry County Development, Planning and Tourism Commission, and I have a prepared statement to read. The Horry County Development, Planning and Tourism Commission is proud of the recent growth the Grand Strand has experienced and the excellent reputation it has as a recreational area. Our major assets are its people and environment. Because of the rapid growth experienced over the last decade, great pressures have been placed on our environment.

Through the efforts of the people of the region, the environmental problems were recognized and efforts were made to correct them and protect the Grand Strand's environment. The Grand Strand Water and Sewer Authority and the others involved have completed a monumental task in the preparation of the Grand Strand 201 Facilities Plan. Implementation of the 201 Plan will insure that the Grand Strand's waterways are protected from pollution and available for recreational purposes. We appreciate the opportunity to make this statement and recommend the implementation of the Grand Strand 201 Plan as quickly as possible.

Moderator: Thank you, sir. Our next speaker will be Mr. Glen Dukes.

Speaker Glen Dukes: My name is Glen Dukes, and I'm with the Engineering Consulting Firm of Black, Crow and Eidsness in Columbia. The Horry County Water and Sewer Authority has asked me to read this prepared statement. The Horry County Water and Sewer Authority recently completed a 201 Facilities Plan for the Western Section of Horry County. During the planning effort, we coordinated our efforts on numerous occasions with the Grand Strand Water and Sewer Authority and became quite familiar with the Grand Strand 201 Facilities Plan. We found the Grand Strand Water and Sewer Authority to be most cooperative and aggressive in doing everything in their power to provide adequate wastewater collection and treatment facilities for the citizens of their service area. In order to continue this effort on the Grand Strand and throughout all Horry County, we recommend implementation of the Grand Strand and Horry County 201 Facilities Plans without further delays. Thank you very much for the opportunity to make this statement.

Moderator: Our next speaker will be Mr. Michael Bell.

Speaker Michael Bell: I'm Mike Bell with the Waccamaw Regional Planning and Development Council. The Waccamaw Council would like to go on record with the following comments. There is a pressing need for up-graded and expanded wastewater treatment facilities in the Grand Strand Region of South Carolina. We feel that further delay of the immediately proposed design and construction activities of the Grand Strand Water and Sewer Authority and the City of Myrtle Beach will not be in the best interest of the residents and visitors to the Grand Strand. Such a delay would be counter to the intent of Public Law 92-500 which is the betterment of the quality of our nation's waters.... Such a delay would be counter to the intent of Public Law 92-500 which is the betterment of our nation's waters, and ah- not the drafting of countless revisions to Environmental Impact Statements. We would like to take specific exceptions to two (2) items on page 9 and the summary on page two dash eleven (2-11). These recommendations for the closing of beaches following rainstorms. This is in Myrtle Beach. We don't know of any such recommendations. No such recommendations have been made by the Waccamaw Regional Planning and Development Council or by anyone else, so far as we know. We also have some reservations about the downward adjustments to the population projections originally made by the Waccamaw, but we do not feel that this warrants any further delay to the proposed design and construction activities. Respective of the three previous comments and overlooking small errors which do not affect the basic conclusions, we wish to indicate our general support of the statements and conclusions made in the Grand Strand Draft Environmental Impact Statement.

Moderator: Thank you, Mr. Bell. That concludes my list of persons who have registered to speak. Have I overlooked anyone, or does anyone now wish to register? (Pause) Finally, I'd like to make the comment that Mr. Upotia, on behalf of the City of Myrtle Beach, has submitted a statement in writing which he would like to have included in the Public Hearing Record. It will be so included. I want to thank you for your testimony here this evening. All the comments made in support of the Project, and Mr. Windell's comments on the cost effectiveness aspect of the comments... of the impact statement, will be carefully considered and responded to in the Final Environmental Impact Statement. The comments received tonight should be a major determining factor in the recommendation for funding as EPA does place great importance on the desires of the local community. Let me remind you that the record will remain open for an additional fifteen (15) days, if you wish to submit further comments. The final Environmental

Impact Statement will take a minimum of sixty (60) days to complete. This is governed by regulations in the Environmental Protection Agency and the Council on Environmental Quality. Upon completion, the document will be filed with the Council on Environmental Quality and made available to the public. Those of you who have commented tonight or submit comments, will receive a copy of the Final Environmental Impact Statement. The U. S. Environmental Protection Agency wishes to thank you for attending this public hearing and participating in this process. Good evening.

STATEMENT TO BE ENTERED INTO THE RECORD OF THE PUBLIC HEARING

DRAFT ENVIRONMENTAL IMPACT STATEMENT
MYRTLE BEACH, SOUTH CAROLINA
APRIL 11, 1977

As a major wastewater collection and treatment entity within the Grand Strand 201 Area, the City of Myrtle Beach, in conjunction with their Consulting Engineers, Consoer, Townsend & Associates, has reviewed the Draft Environmental Impact Statement as prepared by the Environmental Protection Agency for the Grand Strand Region of South Carolina. This review was made as an effort of the City of Myrtle Beach to insure that the wastewater needs of the City and its area of influence have been properly addressed, both by the 201 Facility Planning effort as well as the Draft Environmental Impact Statement.

In consideration of the needs for wastewater facilities, the City of Myrtle Beach authorized Consoer, Townsend & Associates on October 15, 1976, to study the wastewater facility needs of the City of Myrtle Beach and its area of influence. As a result of the City of Myrtle Beach's review of this Draft Environmental Impact Statement, the City of Myrtle Beach desires that the Engineering Report entitled "Expansion of the Myrtle Beach Wastewater Collection and Treatment System - December 1974" be made a part of the minutes of the public hearing. Further, the City of Myrtle Beach desires that the conclusions and recommendations set forth in that Report be considered for inclusion into the final Environmental Impact Statement. In addition to entering this document into the records, the City of Myrtle Beach desires that the following items be considered in the preparation of the final Environmental Impact Statement Documents. These items are as follows:

(1) Existing average daily rehabilitated flow in the maximum month to the Myrtle Beach Treatment Plant (MB-1) is estimated to be 8.0 MGD. During the planning period (year 1997) an additional flow of 4.53 MGD is projected to be generated in the service area of Myrtle Beach Wastewater Treatment Plant, thus the total average daily flow of 12.53 MGD is projected in maximum month. The present and projected flows are summarized in Table 1.

(2) The Draft EIS states that for the discharge to the Intracoastal Waterway, the effluent criteria for the Myrtle Beach Wastewater Treatment Plant (MB-1) is 10 mg/l of BOD and suspended solids and 2 mg/l of NH_3-N. The Draft EIS states that to meet this requirement, secondary treatment, nitrification, and effluent

filtration be provided in order to comply with this effluent standard. The estimated cost for providing these facilities as set forth in the Draft EIS is approximately $1.7 million. It is apparent that the Draft EIS utilized the construction cost utilized in the 201 Facilities Plan wherein it was recommended that grit and screening removal facilities and effluent filters be provided.

As set forth in the Engineering Report prepared for the City of Myrtle Beach by Consoer, Townsend & Associates, it is the City's contention that the existing facilities will not achieve the effluent criteria set forth in the Draft EIS without the construction of additional biological treatment facilities. It is further the contention of the City that the cost of providing such facilities will be substantially greater than the $1.7 million set forth in the Draft EIS.

(3) In consideration of items 1 and 2 above, the Proposed Action as stated in Chapter 5 of the Draft EIS does not adequately reflect the needs of additional wastewater treatment facilities for the City of Myrtle Beach. As indicated above, the cost of providing biological treatment facilities adequate to meet the proposed effluent criteria of the Draft EIS will be considerably more than the $1.7 million set forth in the Draft EIS. It is the contention of the City of Myrtle Beach that these additional biological treatment facilities will be required (to varying degrees) whether or not the 12.5 MGD is accepted as the projected 1997 wastewater flow. In other words, if the 9.0 MGD wastewater flow, as set forth in the Draft EIS, is maintained in the final

EIS, it is the contention of the City of Myrtle Beach that additional biological treatment facilities will be required in order that the proposed effluent criteria be achieved.

Since tourism is the major source of income and employment for the Grand Strand Area, it is essential that all steps be undertaken for the goal of preserving and maintaining the quality of the environment of the Grand Strand Area. Inasmuch as the quality of water within the Grand Strand Area is an essential element of this goal, the City of Myrtle Beach is in full support of the concepts of wastewater collection and treatment set forth in the Draft EIS. With the proper consideration by the Environmental Protection Agency of the items set forth in this Statement, the City of Myrtle Beach is anxious to undertake their part of the steps necessary to achieve the goal of preserving and maintaining the quality of water within the Grand Strand Area.

TABLE I

PROJECTED WASTEWATER FLOW TO THE MYRTLE BEACH WASTEWATER TREATMENT PLANT FROM EXISTING SERVICE AREA

	Present 1976	Year 1982		Year 1987		Year 1997	
			Total		Total		Total
Population:							
1. Resident	9,430	6,413	15,843	6,026	15,456	7,685	17,115
2. Overnight Transient	67,100	45,872	112,972	64,104	131,204	68,914	136,014
3. Day Visitor	11,950	4,551	16,501	6,539	18,489	12,392	24,342
Flow, MGD	8.0*	3.04	11.04	3.97	11.97	4.53	12.53

*Estimated present flow as indicated in preceding discussion.

The Environmental Protection Agency Public Hearing on the Draft Environmental Impact Statement, Grand Strand Region, South Carolina, Monday, April 11, 1977 closed, Monday, April 25, 1977. Total number of pages of Transcript - 22.

EPA Response to Comments and Questions

Reproduced from best available copy.

Mr. Julian Richardson

Implementation of the recommendations of this EIS will begin 30 days following publication of the Final.

Mr. John Hodges

No response necessary.

Mr. Douglas Windell

The wasteload allocation approved by the South Carolina Department of Health and Environmental Control (Appendix I) limit Plant A to a discharge of 6 mgd into the ICWW and allow no discharge from Plant MB-1 at its present location. These allocations made it necessary to construct a joint outfall from Plant MB-1 and Plant C discharging at a point in the Waccamaw River allowing for secondary discharge throughout the planning period. Because of the 6 mgd limit on discharge to Plant A, it is necessary to send as much flow as possible to the Waccamaw outfall to allow sufficient capacity for projected growth in the North Myrtle Beach area to be served at Plant A. The cost analysis has shown it is cost effective to include the environs line in the MB-1 service area. Therefore, the flow from the environs line will go to Plant MB-1.

Total capital costs for Phase 1 construction will be $43.8 million. Seventy-five percent of this cost will be funded by EPA. The remaining twenty-five percent must be funded at the local level. In addition, all operation and maintenance

Mr. Michael Bell

No recommendations have been made to close beaches following rainstorms.

EPA believes that the population projections contained in the Draft EIS are accurate. The selected system described in this Final EIS is based upon these projections.

Statement of the City of Myrtle Beach

1. The design year flow of Plant MB-1 has been increased to 12.0 mgd based upon information presented in the report entitled "Expansion of the Myrtle Beach Wastewater Collection and Treatment Systems, December, 1976".

2. A bio-disc system will be constructed at the existing Plant MB-1 site. The projected capital costs of the expanded MB-1 facility are as follows:

Plant MB-1 expansion - $8.125 million
Force to Plant C outfall - $5.823 million
Pump Station - $0.846 million
Portion of Plant C outfall - $2.294 million

3. The bio-disc system recommended will be instituted at the

costs and costs for construction of collector lines must be funded at the local level.

In answer to the request raised at the public hearing, EPA conducted a new estimate of sewer service charges. These costs are based upon the local share of construction costs for the planned project and the projected operation and maintenance costs. No capital costs for new collector sewers are included since EPA will not participate in the funding of collector sewers.

Cost/1000 gal

Plant + System	PH 1	PH 2	PH 3
A	$1.12	$1.12	$1.12
IP-1	$0.52	$0.48	$0.43
G	$0.56	$0.68	$0.84
C	$0.60	$0.60	$0.60

Mr.E.S.Southern

No response necessary.

Mr. Glen Dukes

No response necessary.

Plant MB-1 site and the design year size of the plant will be increased to 12.0 mgd.

CHAPTER IV

WRITTEN COMMENTS AND QUESTIONS ON DRAFT EIS AND EPA RESPONSE

DEPARTMENT OF THE AIR FORCE

REGIONAL CIVIL ENGINEER, EASTERN REGION (HQ USAF)
528 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30303

REPLY TO ATTN OF: AFRCE/ER-V1

26 April 1977

SUBJECT: Draft Environmental Impact Statement (EIS), Grand Strand Region, South Carolina Wastewater Treatment Facilities

TO: Environmental Protection Agency
Attn: Mr. John E. Hagan, III
Chief, EIS Branch
345 Courtland Street, N. E.
Atlanta, GA 30308

1. Refer to your letter, dated February 28, 1977, subject as above.

2. We have reviewed subject Draft EIS, and provide the following comments:

a. Summary, Section III, paragraph 3, page 22. In the final paragraph of summary, the statements tend to indicate that a decision has already been made on which alternative should be selected. This decision should not be made until the environmental analysis process has been completed. Suggest this section be reworded to state that, "Given these two choices, Alternative I was selected as the proposed action in the environmental statement because of the determination... ."

b. Chapter 4, paragraph 4.2.3, page 4-8. The statements do not clearly establish whether existing Plants LB-1, MB-1, NMB-1, NMB-2, and AF-1 are capable of providing secondary treatment starting 1 July 1977 in accordance with requirements of Public Law 92-500, Section 301. Recommend that paragraph 4.2.3 address National Pollutant Discharge Elimination System (NPDES) permit requirements, and state whether those plants will be in compliance.

c. Chapter 5, paragraph 5.2, page 5-1. Recommend that discussion of Myrtle Beach AFB Treatment Plant (AF-1) state that this facility will continue to be manned and operated by Air Force personnel until the plant is phased-out.

d. Chapter 6, page 6-9.

(1) Paragraph 6-5. This section does not address the impact of construction and plant operation upon air quality. Recommend that this section discuss the anticipated increases in ambient air pollutants and whether air quality standards will be exceeded.

EPA-IMPACT STATEMENTS
RECEIVED
[illegible] 2[illegible] 1977
REGION IV, ATLANTA, GA.

United States Department of the Interior

OFFICE OF THE SECRETARY

Southeast Region / 148 Cain St., N.E. / Atlanta, Ga. 30303

MAY 2 1977

ER-77/219

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

We have reviewed the draft environmental impact statement for wastewater treatment facilities, Grand Strand Region, Georgetown and Horry Counties, South Carolina, as requested in Mr. Jack E. Ravan's February 28, 1977, letter to the Assistant Secretary, Program Policy.

We offer the following comments:

General Comments

The draft statement is generally adequate in addressing project impacts on fish and wildlife resources in the project area.

Minor quantities of clay, sand, and gravel are produced in Georgetown and Horry Counties at present. One clay operation is located near Myrtle Beach, but there is no indication that it would be affected by the proposed project. The statement satisfactorily covers the impact the proposal would have on mineral resources of this area.

We are pleased to note identification of sensitive natural and cultural (historical, archeological, architectural) resources in the planning document.

Specific Comments

Page 1-5, section 1.2.2. - The term "water table" in relation to artesian aquifers should be changed to artesian pressure or piezometric surface, or some other term, to avoid confusion with the proper use elsewhere in the text of "water table" in reference to shallow unconfined aquifers.

Page 1-5, section 1.2.3. - The discussion of the contribution to surface-water pollution from nonpoint sources should consider exfiltration of sewage in areas where the ground-water head is not sufficient to maintain infiltration into the sewage transmission system.

Page 2-15, section 2.1.9. - Eel grass (Zostera marina) is described as being the dominant submerged plant species in the Atlantic Intracoastal Waterway in the Grand Strand 201 area. This statement is erroneous as eel grass is not known to exist in the Grand Strand area.[1]

Page 2-22 - Although a more detailed analysis of impacts may have to await completion of current studies, the environmental statement should utilize the representative values for transmissivity and storage coefficient given in section 2.2.2. to indicate the magnitude of drawdown produced over the life of the project by a typical large-capacity well; this would furnish a basis for comprehension of indirect impacts on ground water.

Page 2-30, section 2.3.3. - It is stated that the estuaries provide the necessary habitat and spawning conditions for brown shrimp and white shrimp. This statement is erroneous because white shrimp and brown shrimp spawn offshore.

Page 2-37, Figure 2-6 - Figure 2-6 depicts fresh and saltwater marshes rather than only freshwater marshes as the title suggests.

Page 2-64, section 2.6.2. - Three areas within the Grand Strand area have been identified as having the potential for official recognition as Natural Landmarks by the Department of the Interior. The names of the sites are: Bellefield Plantation, Hobcaw Forest, and Huntington Beach State Park. We are enclosing information on the three sites.

Page 2-67, section 2.6.4. - The threatened species list fails to include the American alligator (Alligator mississipiensis) which is known to occur in the Grand Strand 201 area.

Page 3-45, section 3.7.2. - The preliminary archeological survey report by Dr. Reinhold J. Engelmayer describes the corridor examined, for sewage lines, as being 7 feet wide. There is no indication in the report that effort was made to determine the extent of a given site located in the 7-foot-wide path. It is possible that the sites extended beyond the boundary of the surveyed corridor. We recommend that the final statement include discussion of the boundaries of all sites located in the survey. The identification of a small disturbed portion of a larger relatively undisturbed site may have occurred. The undisturbed area of a large site may contain a resource eligible for nomination to the National Register of Historic Places. All such sites must be evaluated for significance. The considerations required by Section 106 of the Historic Preservation Act of 1966 (Public Law 89-665), Executive Order 11593, and 36 CFR 800 are applicable to significant sites.

---

[1] Radford, A.E., H. E. Ahles, and C. R. Bell, Manual of the Vascular Flora of the Carolinas, University of North Carolina Press, Chapel Hill, North Carolina, 1968, page 44.

Page 7-3, section 7.2.1. - This section stated ". . . where ditches have probably already destroyed any archeological resources which might have been there." It is the responsibility of the Federal agency to determine the extent of any resources in the area of the proposal's potential impacts. Only by making determinations of actual extent of such resources and evaluating their potential or actual significance can an adequate determination of impacts be made.

Page 8-20 - There appears to be some inconsistency within the text concerning the probable magnitude of induced growth as a secondary impact of the project. In section 8.2.1. the prediction is made that with municipal sewers available the Grand Strand area would be able to compete more strongly for clean industry and a larger permanent population. Page 8-22 presents some estimates of population growth. On page 8-32 impacts of induced growth are described. On page 8-33, however, the prediction is made that the Grand Strand project would not induce further growth. Inasmuch as increased industry and permanent population would result in greater consumption of ground water, even if tourism decreased somewhat, it seems that the appraisal of the related secondary impacts need reexamination.

Also, the potential for increasing land subsidence over the life of the project as a result of withdrawals of ground water from aquifers should be recognized both under present conditions and with increased industrial development and induced population growth. The presence of clays and fine grained sediments in the Pee Dee and Black Creek Formations suggests that appreciable subsidence should occur ultimately.

Page 8-29, section 8.2.3.1. - See comments for sections 3.7.2. and 7.2.1.

Pages 8-32 and 8-33, section 8.3.2. - The decrease in recharge to water-table aquifers represents not only an impact of induced growth, as stated, but also more directly of decreasing discharges from septic tanks and possibly seepages from other treatment facilities, as well as from the construction of more impervious surfaces in residential and industrial developments. The quantities involved may be comparatively small, but we suspect that the net impact on quality of the shallow water will be beneficial. We suggest that this impact should be reassessed.

Page 9-5, section 9.2.2. - This section should be expanded to include discussion on the Federal agency's responsibility to comply with 36 CFR 800 in the evaluation of cultural resources for significance and eligibility for nomination to the National Register of Historic Places and compliance with Section 106 (Public Law 89-665) regarding significant resources.

We appreciate the opportunity to comment on this environmental statement.

Sincerely yours,

James H. Lee

James H. Lee
Regional Environmental Review Officer
Southeast Region

Attachment

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION IV
50 7TH STREET N.E.
ATLANTA, GEORGIA 30323

OFFICE OF THE
REGIONAL DIRECTOR

April 12, 1977

HEW-755-4-77

John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Subject: Grand Strand Region, South Carolina
EPA Project No. C450381

Dear Mr. Hagan:

We have reviewed the subject draft Environmental Impact Statement. Based upon the data contained in the draft it is our opinion that it does not address this Department's responsibilities. Information on community facilities, services and economics are vitally necessary for a proper evaluation. Some of these items are schools, health, welfare, relocation of persons, fire departments, police departments, minorities, etc. If the project does not impact these items, a statement to this effect will expedite this office's review. These items may be included in the Final Impact Statement.

The opportunity to review this statement is appreciated.

Sincerely yours,

Philip P. Sayre

Philip P. Sayre
Regional Environmental Officer
DHEW-Region IV

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL OFFICE
PERSHING POINT PLAZA, 1371 PEACHTREE STREET, N.E.
ATLANTA, GEORGIA 30309

March 16, 1977

REGION IV

IN REPLY REFER TO:
4C

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

We have forwarded the Draft Environmental Impact Statement (EIS) for the Grand Strand Region, South Carolina Wastewater Treatment Facilities, to the HUD Area Office in Columbia, South Carolina, for review.

Functionally the HUD Area Offices are our reviewing body for activities within their respective states. They have been advised to send their comments directly to you.

Sincerely,

James R. Patterson

for Charles N. Straub
Assistant Regional Administrator for
Community Planning and Development

AREA OFFICES
ATLANTA, GEORGIA · BIRMINGHAM, ALABAMA · COLUMBIA, SOUTH CAROLINA · GREENSBORO, NORTH CAROLINA · JACKSON, MISSISSIPPI
JACKSONVILLE, FLORIDA · KNOXVILLE, TENNESSEE · LOUISVILLE, KENTUCKY
Insuring Offices
Coral Gables, Florida · Memphis, Tennessee · Nashville, Tennessee · Tampa, Florida

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 919
CHARLESTON, S.C. 29402

SACEN-E

29 March 1977

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Dear Mr. Hagen:

This is in response to your letter dated 8 March 1977 concerning the Draft Environmental Impact Statement (DEIS) for the awarding of grant funds to the Grand Strand Water and Sewer Authority for wastewater treatment facilities to service the Grand Strand 201 area in Horry and Georgetown Counties, South Carolina. We have reviewed the DEIS and have no comment at this time.

Sincerely,

HARRY S. WILSON, JR.
Colonel, Corps of Engineers
District Engineer

Copy furnished:
HQDA (DAEN-CWP-V)
Wash DC 20314

Division Engineer, South Atlantic
Attn: SADPD-R

General Counsel (10 cys)
Council on Environmental Quality
Executive Office of the President
722 Jackson Place, N.W.
Washington, D. C. 20006

EPA IMPACT STATEMENTS
[illegible] 1 1977
[illegible] ATLANTA, GA.

State of South Carolina
Office of the Governor

JAMES B. EDWARDS
GOVERNOR

DIVISION OF ADMINISTRATION
Edgar A. Brown Building
Columbia, South Carolina 29201

April 25, 1977

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

The State Clearinghouse has completed the review of the draft environmental impact statement on the Grand Strand Region, South Carolina Wastewater Treatment Facilities, Project No. C450381. The enclosed comments are offered for your consideration in preparing the final statements from the following state agencies:

S. C. Wildlife and Marine Resources Department
S. C. Water Resources Commission
S. C. Land Resources Conservation Commission
Pee Dee Health Systems Agency
S. C. Department of Health & Environmental Control

Please contact me if you have any questions.

Sincerely,

Elmer C. Whitten Jr.

Elmer C. Whitten, Jr.
State Clearinghouse

Enclosures

IMPACT STATEMENTS
APR 27 1977
RECEIVED
REGION IV, ATLANTA, GA.

"Safety Belts — Save Lives and Reduce Injuries"

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Lachlan L. Hyatt, Chairman
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William C. Moore, Jr., D.M.D.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

E. KENNETH AYCOCK, M.D., M.P.H., COMMISSIONER
J. MARION SIMS BUILDING — 2600 BULL STREET
COLUMBIA, SOUTH CAROLINA 29201

March 25, 1977

Mr. John E. Hagan, III
Chief, EIS Branch
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

This office has reviewed the Draft Environmental Impact Statement for the Grand Strand Region, South Carolina (EPA Project No. C450381) and we have the following comments:

Section 1.3.1 Proposed Facilities

Figure 4-1 referenced in this section shows the location of the facilities but does not indicate the boundaries of the service areas. This information would be helpful and should be included.

Section 2.1.3 Intracoastal Waterway

The last paragraph mistakenly refers to the Waccamaw River and cites tables 2-3 and 2-4 which are for the Intracoastal Waterway. This should be corrected to read "the Intracoastal Waterway".

Section 2.3.3-4 Estuaries and Salt Water Marshes and Fresh Water Marshes

Actual acreage of the several types of wetlands found in the project area should be included in the final impact statement. This information is important in evaluating the magnitude of adverse and favorable impacts of the project on these wetlands.

Section 2.3.5 Closed Shellfishing Areas

The final impact statement should include updated information on shellfish area closings within the Grand Strand Area.

Section 3.11.4 Environmental Studies

The results and interim reports of the regional surveys and other environmental studies should be included in the final impact statement when possible.

Section 4.3.5 Comparison of Alternatives

The rationales and justifications given for assigning ratings to the various alternatives are superficial and unclear. More detailed explanations for the assigned ratings should be included in final impact statement. These sections will come under close scrutiny since they form the basis for selecting the most acceptable alternative.

Section 5 Proposed Action

Recently, the Preliminary Engineering Report on the expansion of the Myrtle Beach wastewater collection and treatment system was submitted to this Department. This report has shown a necessary flow increase of greater magnitude during the upgrade of MB-1 than shown in the draft Environmental Impact Statement. We therefore reserve comment on this development until possible ramifications have been studied by our staff.

Section 8.3.6(2) Noise

The final environmental impact statement should include data on present ambient noise levels in the project area. The anticipated percent increases in noise levels are meaningless unless data on the present levels are given.

We appreciate the opportunity to comment on this proposed project and if we can be of any assistance, please contact us.

Sincerely,

J. C. Hawkins, P.E., Chief
Bureau of Wastewater & Stream Quality
Control

JCH:JME:bg

cc: Mr. James G. Zack, Jr.
Mr. C. Barry Shedrow

BOARD MEMBERS

Lachlan L. Hyatt, Chairman
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William C. Moore, Jr., D.M.D.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

E. KENNETH AYCOCK, M.D., M.P.H., COMMISSIONER
J. MARION SIMS BUILDING — 2600 BULL STREET
COLUMBIA, SOUTH CAROLINA 29201

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

March 14, 1977

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

This office has reviewed the draft environmental impact statement on the Grand Strand Region, South Carolina Wastewater Treatment Facilities, Project No. C 450381. Due to the recent studies, particularly in the Georgetown area, we recommend that Section 2.5.2, "Existing Air Quality" be corrected and updated as follows:

2.5.2 Existing Air Quality

The permanent and seasonal residents of the planning area enjoy high quality air for several reasons:

Weather conditions provide adequate dispersal of pollutants;

Few stationary sources of air pollution exist in the planning area; however, such large sources as Georgetown Steel Corporation, International Paper Company, Winyah Steam Plant, and Grainger Steam Plant are located in the neighboring areas of Georgetown and Conway respectively;

There is no widespread traffic congestion.

The major contributors to air pollution in the area are automobiles and gasoline-engine boats. Aviation operations at Myrtle Beach Air Force Base, Mrytle Beach Airport, and other smaller airports, together with stationary sources at Conway and Georgetown are the other significant contributors to air pollution.

Air quality data for Conway and Georgetown has been measured daily since 1972 by the South Carolina Department of Health and Environmental Control at sampling stations located immediately at the boundaries of the planning area. Summaries of the data are compared to standards for the corresponding air quality parameters for 1972, 1973, 1974, 1975, and 1976 in Table 2 - 10. Interpretation of these data yields the following conclusions:

Concentrations of particulates in the Georgetown area have violated the standards for the past several years, while concentrations of particulates in Conway are well within the standards.

Sulfur dioxide concentrations for both Conway and Georgetown have been about one-tenth of the standard.

Gasoline-engine-related pollutants, nitorgen dioxide and total oxidants, have been well within the standards.

These results imply that:

Dispersion of particulates in the southern portion of the planning area leads to concentration of particulates in the area which are within standards.

In the remainder of the planning area, particulates are further dispersed so that the vast majority of the sections have particulate concentrations which are well within the limits of the standards.

The area has very low concentrations of sulfur dioxide.

Gasoline-engine-related pollutants are well within the standards.

Analysis of data collected more recently in the Georgetown area has shown only marginal attainment of the national standard for total suspended particulates; however, the State Implementation Plan (SIP) has been declared inadequate for maintaining the particulate standard over the next ten years. The Department of Health and Environmental Control and Environmental Protection Agency are now making further detailed studies of this area to more clearly define the reasons for inability of the SIP to maintain this standard. Preliminary results have indicated that this maintenance area is probably confined to the city of Georgetown. Study of the area will continue with examinations of such things as automobiles and their operations, fugitive emissions from industrial sources, dust from traffic or other non-industrial activity, and malfunctions of controls on sources normally in compliance, as well as the traditional approach of emission limits on industrial sources. Results of the study are expected to be completed by Fall 1977.

Table 2 - 10

Air Quality Data for Conway, South Carolina

Air Quality Parameter	Annual Measure	Standard, Microgram/ Cubic Meter	1972	1973	1974	1975	1976
Suspended Particulates ug/m^3	Geometric Mean	60	40	42	36	43	40
Sulfur Dioxide ug/m^3	Arithmetic Average	80	3	5	8	5	2
Nitrogen Dioxide ug/m^3	Arithmetic Average	100	42	32	17	15	20
Total Oxidants ug/m^3	Arithmetic Average	100	19	20	16	-	-

Air Quality Data for Georgetown, South Carolina

Air Quality Parameter	Annual Measure	Standard, Microgram/ Cubic Meter	1972	1973	1974	1975	1976
Suspended Particulates ug/m^3	Geometric Mean	60	62	76	72	73	72
Sulfur Dioxide ug/m^3	Arithmetic Average	80	4	6	9	6	6
Nitorgen Dioxide ug/m^3	Arithmetic Average	100	40	40	17	22	33
Total Oxidants ug/m^3	Arithmetic Average	100	12	10	15	-	-

Other areas of the state identified by the Department of Health and Environmental Control as problem areas for air pollution include Charleston (AQCR 199), Columbia (AQCR 200), Augusta-Aiken (AQCR 053), and Greenville-Spartanburg (AQCR 202).

Very truly yours,

Robert E. Malpass

Robert E. Malpass, P. E.
Assistant Chief
Bureau of Air Quality Control

REM/ms

South Carolina
Project Notification & Review Sy

PROJECT NOTIFICATION REFERRAL

08-200
(Control Number)

4/4
SUSPENSE DATE

RECEIVED
APR 04 1977
DIVISION OF
ADMINISTRATION

TO:
St. Land Resource Conservation
P.O. 11708
Columbia, SC 29211

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946
Please return this form prior to the above suspense date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Signature Elmer C. Whitten Jr
Name Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

☐ PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
☐ AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
☒ AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

For technical assistance in determining the suitability of soils for the intended use and for the preparation of a sediment and erosion control plan, please contact the local county Soil and Water Conservation Districts in the Grand Strand Regions of South Carolina.

(Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY:
SIGNATURE:
DATE: March 24, 1977
TITLE: Director, Department of Soils and Resource Development
PHONE: 758-2823

State of South Carolina
Water Resources Commission

APR 25 1977
DIVISION OF
ADMINISTRATION

Clair P. Guess, Jr.
Executive Director

April 22, 1977

Mr. Elmer C. Whitten, Jr.
A-95 Coordinator
Division of Administration
1205 Pendleton Street
Columbia, S.C. 29201

Dear Elmer:

Members of the staff at the Water Resources Commission have reviewed the Draft Environmental Impact Statement on the Grand Strand Region, South Carolina, EPA Project No. C450381, and have the following comments:

First of all, to review the Draft EIS without a copy of the 201 Facilities Plan (Black,Crow and Eidsness) is difficult. We have, therefore, reviewed the report for data accurateness as opposed to plan feasibility. If a copy of the 201 Plan is available we would appreciate receiving it.

2.1.3 Intra Coastal Waterway

Comment: The normal flow from Enterprise Landing is to the North, not South. Under low flow the "null point' may move further south to Bull Creek and cause a change in flow from south to north. refer to Frank Johnson report, A Reconnaissance of the Hydrology of the Intracoastal Waterway from Bucksport to Little River, South Carolina.

2.1.8 Aquatic Plants

Comment: Eladea is a serious pest in some areas.

2.3.3 Estuaries and salt water marshes

p.2-32 Low Marshland occurs from mean low water to about mean high tide.

p. 2-36 In the estuary, detritus is the main source of energy for a great number of aquatic species - shellfish, shrimp, crabs and finfish.

Also,"Section_____of appendix____presents a list..."?

2.3.4 Freshwater marshes

Comment: The wildlife section could be expanded. There is no mention of waterfowl.

As with most publications, it is highly recommended that a list of references or a bibliography be included with the document.

Without the benefit of a detailed plan, we advise the applicant that a permit issued by the State of South Carolina is required for any construction, alteration, dredging, filling or other activity when such activity involves or will involve the use of any land below the mean high water line or any submerged lands (to the three mile limit) on the coast or any navigable waterway within this state. If the applicant is in doubt as to whether a State permit will be required, he may submit to the South Carolina Water Resources Commission, P.O. Box 4515, Columbia, South Carolina, 29240, a letter describing the location of the proposed construction.

Attached are specific comments from the Geology/hydrology division of the S.C. Water Resources Commission to clarify statements and be used as constructive criticism.

The staff of the S.C. Water Resources Commission appreciates the opportunity to comment on this important matter and reserves the right to further comment, if needed, at a later date. If you have an[illegible]tions, please feel free to contact us.

Sincerely,

Stephen T Sutterfield

Stephen T. Sutterfield
Civil Engineer

STS:rhv
Enclosures

APR 25 1977
DIVISION OF
ADMINISTRATION

Specific Comments

Geology/Hydrology Division, South Carolina Water Resources Commission

These comments are submitted to clarify statements and as constructive criticism.

Section 1.2.2

1) Actually, only the water table (potentiometric surface) of the Black Creek aquifer system has been "significantly" lowered as a result of pumpage. Few large-capacity wells are completed in the Peedee aquifer system and none are completed in the Tuscaloosa aquifer system.

2) The statements about saltwater intrusion and chlorides are somewhat confusing. Although there is no evidence to date to indicate that saltwater moves from the ocean into the artesian aquifers, there are many water-bearing sands (aquifers) within the Peedee and Black Creek aquifer systems which contain excessive concentrations of chlorides and dissolved solids, (presumably "salty" ground water which has been imcompletely "flushed" from the water-bearing sands). Therefore, the potential does exist that "saltwater intrusion" could occur from improperly located and constructed wells and near cones of depression.

3) The statements that the "water-table aquifer . . . does leak into the main water supply aquifer . . . " has not been confirmed by geohydrologic data.

4) The statements concerning "contamination of the water table aquifer" need clarification. What evidence is there to indicate that the water-table aquifer has been contaminated? We agree that there probably is some threat to the water table aquifer by existing regional wastewater treatment and disposal systems but has this been confirmed? Again in section 6.2 contamination of the shallow aquifer is mentioned and that "the groundwater quality will most likely be improved enough to comply with present drinking water standards." What data are available to show that the quality does not now meet drinking water standards?

Section 2.2

5) The statement that "the study was completed and published in 1976" is erroneous. The report has been finished and will be published in 1977.

6) In section 2.2.3 the statement that the mineral content of water from the Tuscaloosa aquifer decreases from north to south may be true but few wells have been completed in the Tuscaloosa on which to base this assumption.

7) In section 2.2.4 the statement that "heavy pumping activities near areas such as Myrtle Beach have lowered the recharge potential of the Peedee-Black Creek aquifer" is erroneous. To the contrary, pumpage may have increased the recharge potential. The statement that "water from the water

table aquifer will leak slowly into the Peedee-Black Creek and increase the velocity of horizontal movement within the Peedee-Black Creek" has not been substantiated; if leakage did occur, it would not increase horizontal velocity in the Peedee-Black Creek.

8) Section 2.2.5 contains contradictory statements. See comment number 2.

xc: Al Zack and Ken Stevens
John Stallings

RECEIVED MAR 0 8 1977

South Carolina
Project Notification & Review System

STATE APPLICATION IDENTIFIER	08-2003-7
(Control Number)	
SUSPENSE DATE	4/4

PROJECT NOTIFICATION REFERRAL

TO:
Pee Dee Health System Agency
P. O. Box 5959
Florence, SC 29502

RECEIVED
MAR 29 1977
DIVISION OF
ADMINISTRATION

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946 Please return this form prior to the above suspense date to:

State Clearinghouse
Division of Administration
1205 Pendleton Street
Columbia, South Carolina 29201

Signature Elmer C. Whitten Jr.

Name Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

☐ PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES

☐ AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS

☒ AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

The Draft Environmental Impact Statement does address a need in HSA III Region & would like to be kept up to date as to when the final edition is printed.

(Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY:

SIGNATURE: Reginald Y. [illegible]

DATE: 3/29/77

TITLE: Director Project Review & Systems Monitoring

PHONE: (803) 669-1347

South Carolina Department of Archives and History
1430 Senate Street
Columbia, S. C.

P. O. Box 11,669
Capitol Station 29211
803 — 758-5816

April 13, 1977

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30308

Re: C450381, Grand Strand Region,
South Carolina - Draft EIS

Dear Mr. Hagan:

This office has received and reviewed the Draft Environmental Statement: Grand Strand Region, South Carolina, EPA Project No. C450381. We concur with the conclusions reached in 7.2.1, 7.2.2 and 9.2.2 that adequate measures have been, or will be, taken to avoid impacting archeological and historical resources. We note that these conclusions are based on survey data found acceptable by the State Archeologist in his letter of June 11, 1976, included in Appendix G.

We would appreciate receiving a copy of Dr. Reinhold J. Engelmayer's final archeological survey report before we comment on the final environmental statement.

The Federal procedures for the protection of historic properties (36 CFR 800) require that the Federal agency official in charge of a Federally funded or licensed project consult with the appropriate State Historic Preservation Officer. The procedures do not relieve the Federal agency official of the final responsibility for reaching an opinion of his own as to whether or not historic values have been adequately taken into account in allowing the project to proceed. The opinion of the State Historic Preservation Officer is not definitive, either by law or by established Federal procedure. In reaching a conclusion of his own, the Federal agency official may well wish to consult other experts.

Sincerely,

Charles E. Lee

Charles E. Lee
State Historic Preservation Officer

EPA - IMPACT STATEMENTS
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ATLANTA, GA

CEL/sa
CC: Dr. Robert L. Stephenson
USC Institute of Archeology and Anthropology

Miss Kathy Hendrix
Waccamaw Regional Planning and Development Council

South Carolina
Wildlife & Marine
Resources Department

James A. Timmerman, Jr. Ph.D.
Executive Director
H. Wayne Beam, Ph.D.
Director of
Natural Area Acquisition and
Resources Planning

Preceding page blank

April 15, 1977

4 Carriage Lane, Suite 205
Charleston, South Carolina 29407
(803) 556-4070

Elmer C. Whitten, Jr.
State Clearinghouse
1205 Pendleton Street
Columbia, South Carolina 29201

Re: 08-2003-7; DEIS, Grand
Strand Region, South Carolina,
EPA Project No. C450381

Dear Mr. Whitten:

The South Carolina Wildlife and Marine Resources Department has reviewed the Draft Environmental Impact Statement for EPA Project No. C450381 concerning planned regional wastewater treatment facilities in the Grand Strand 201 area and offer the following comments.

This document generally provides an adequate assessment of the projects impacts on the marine and wildlife resources of the area. In our opinion, the proposed action is needed since it will improve the overall water quality of areas currently affected by low quality wastewater discharge and will result in the re-opening of estuarine areas now closed or conditionally opened to shellfish harvesting. However, the Department does realize that increased growth in this area does pose a most serious threat to wildlife populations, but in turn we also realize that this growth is projected to be substantial regardless of whether or not plans for a new wastewater treatment system are implemented. The DEIS correctly points out that the lack of a centralized wastewater collection and treatment system has not impeded growth in the past.

Therefore, the Department endorses this project and recommends approval of federal assistance so that the project can commence as soon

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as possible.

General and specific comments regarding certain portions of the document follow:

Direct effects of the wastewater treatment system on wildlife habitat will not be great. The construction of several treatment plants, settling ponds, excavating and dredge disposal activities, and pipeline right-of-ways will probably require 200 acres or less.

It would appear from the projections of economic and population growth in the report that deer management on a renewable resource basis on the Buist tract will be phased out within the next five to ten years. With encroaching land development the black bear in this area will, in all likelihood, become a thing of the past. The report correctly points out that the ability of displaced wildlife to move to other areas is limited. These resources and management options could be lost.

The report mentions several species of orchids and insectivorous plants which occur on the Buist tract. These species will be threatened by land development not because certain natural areas and greenbelts will not be preserved, but because entire systems of land management will be changed. It is our belief that changes involving drainage and fire exclusion may significantly threaten these plant populations.

Specific comments regarding certain portions of the document are as follows:

1.) P. 2-2 Water Quality and Quantity: Reference is made to Figure 2-1 which is supposed to indicate water usage class of each water system in the planning region. This figure shows the location of sampling stations, but does not indicate classifications in its present form.

2.) P. 2-7. Intracoastal Waterway: The effect of the Pee Dee River upon the AIWW is unclear and needs clarification. Is this relationship the result of tidal influences during low flood periods?

3.) P. 2-12. Sources of Wastewater: Figure 2-2 according to paragraph 2 indicates the locations of the areas served by septic tanks, municipal wastewater treatment plants, private and semi-public wastewater treatment plants, and industrial wastewater plants. This figure does not differentiate between these types of wastewater treatment, but shows sampling locations. Also, symbol for hatched areas is not presented.

4.) P. 2-14. Pondweed Potamogeton is incorrectly spelled.

5.) P. 2-15. Aquatic Plants: The statement concerning the presence of eel grass near beaches of the planning area is not true. To the best of our knowledge, the southern limit of eelgrass (Fostera marina) is Cape Hatteras, North Carolina. Consequently, eelgrass would not be present in the Grand Strand 201 area.

6.) P. 2-17, Paragraph 3. Aquatic Life: This paragraph should briefly mention the importance of artificial reefs and live bottom areas to offshore sportsfishermen.

7.) P. 2-30, Paragraph 4.L.F. The estuary does not provide spawning habitat for white and brown shrimp, as stated. These shrimp spawn offshore. However, the estuary does serve as an important nursery ground for these species.

8.) P. 2-35. Figure 2-5 does not indicate important shellfish growing areas in North Inlet, Pawleys Island, or Little River.

9.) P. 2-36. Estuaries and Salt Water Marshes (Cont'd.). The last paragraph of this section states that "only a small fraction of the detritus is used by the salt marsh". The validity of this statement is questioned since, studies by John Teal, ("Energy flow in the salt marsh ecosystem of Georgia" Ecology 43, 1962) estimates that approximately 45% of the marsh production is exported to the estuaries, whereas the remaining 55% is consumed in the marsh by a variety of organisms. Also, in this paragraph, reference is made to "Section of Appendix " (?) concerning a plant list of salt marsh vegetation. This section could not be found in the document.

10.) P. 2-36. Freshwater marshes. The Marine Resources Division of the South Carolina Wildlife and Marine Resources Department has mapped the region's tidal freshwater non-forested wetlands. Also, a list of the fish species utilizing these areas as spawning or nursery grounds would be valuable.

11.) P. 2-36. Figure 2-6 not only shows freshwater marshes and swamps, but also depicts salt and brackish marshes. These latter areas should be deleted from the map, if only freshwater wetlands are to be represented.

12.) P. 2-65. North Island. Nesting of loggerhead turtles on the beaches of North Island should also be mentioned in this section, since North Island is one of the more important nesting beaches.

13.) P. 2-66. Huntington State Park. Some of the ducks that overwinter in these ponds should be indicated, such as canvasback, ruddy ducks and widgeons. Waiter Island. Panicum amarulum is misspelled.

14.) P. 2-67. The American alligator should be added to the list of endangered species, as should others that were mentioned on P. 2-56 and 57.

We appreciate having the opportunity to review this statement. Please feel free to contact us at any time if additional information is required.

Sincerely,

James A. Timmerman, Jr.

James A. Timmerman, Jr. DcW
Executive Director

JATjr:lsb
cc: John E. Hagan, III
Charles Bearden
H. Wayne Beam
Jeff Fuller

TOWN OF NORTH MYRTLE BEACH
"WATCH US GROW"
Box 1038 — Phone 272-5202
North Myrtle Beach, South Carolina 29582

April 12, 1977

Mr. John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

Prefacing my comments, I wish to note the City of North Myrtle Beach endorses the "regional" concept in waste water treatment. It must be stressed, however, that we believe any regional plant must be cost effective. With the many diverse demands placed upon governmental jurisdictions and the ever increasing costs associated with them it has become even more imperative to ensure the cost effectiveness of all projects. As a result, the following comments are offered in a positive constructive manner, for the record of the public hearing for the Grand Strand Environmental Impact Statement, with the hope fiscal affordability and responsibility will be ensured.

1) We have been notified the City of Myrtle Beach has expressed an interest in expanding and upgrading their treatment facility (MB-1) to 12.0 MGD. It has been noted that none of the alternatives evaluated considered MB-1 at that capacity. The substantial increase in capacity is anticipated due to the discovery of I/I problems within the Myrtle Beach system and also due to the permanent inclusion of the service area of the Environs Sewer as part of the Myrtle Beach system. If this request is approved by DHEC and EPA, it will be in direct conflict with the 201 Plan and the EIS. Also, the foundation of the 201 Plan to EIS will be altered creating a situation which would require a complete review and reevaluation of all the alternatives considered. An expected result of this change would be the proposed plant "A" becoming not as cost effective due to its reduced service area as the retention of the North Myrtle Beach facilities for the duration of the planning period with provisions for their upgrade. It is imperative, especially in the Grand Strand, that the public not be burdened with projects that are not cost effective.

2) Both the 201 Plan and the EPA's EIS have not adequately reflected the true cost of providing adequate sewer service to the Grand Strand. In EPA Program Requirements Memorandum No. 76-3, it was stated that it was EPA policy to require facility plans to project adequate financial information to enable the public to

ascertain their financial obligation. As a result, we believe it is reasonable to assume that the same would be required of an EIS written by EPA if the 201 Plan did not adequately present this information. In section 7.7 user charges were projected but it was observed that the user charge presented was taken from a rate study prepared by Black, Crow and Eidsness in April, 1975. This rate study is not consistent with the EPA regulations in that all residents of the Grand Strand were assessed a user charge to finance all the facilities proposed in the 201 Plan. This means, for example, the residents of North Myrtle Beach would be required to assist in the financing of plant "G" which would not serve them and is not even in the same municipality. Grand Strand Water and Sewer Authority has indicated this is no longer a viable approach to be considered but due to consideration of the April, 1975 study in the EIS we believe our concerns needed to be on record.

Since the cost per customer determines public support of the project and its resulting feasibility, it is important that the EIS present to the public a clear representation of the cost of each operable treatment unit and the financial responsibility of each resident served by that particular operable treatment unit. It is also imperative that the public be informed of how the proposed facilities will be funded, i.e., EPA grants, general obligations bonds, etc.

Further, neither the 201 Plan nor the EIS have adequately presented to the public what it will cost to operate and maintain the proposed treatment systems. Such things as the cost of energy and manpower requirements are key elements in O&M cost that deserve special attention.

Also, no estimate has been made as to the cost of the collector sewers that are a vital component to the treatment system. The cost of collectors could as much as double the cost presented in the 201 Plan. It is important for the public to also understand that collectors are not awarded grants by the EPA which means much more of a financial burden on each resident. We realize that these costs will be present no matter what plant system is developed but believe the cost impact of them should be noted so the public is not misled as to the total cost of providing sanitary sewer service.

In summary, it should be noted the Grand Strand Water and Sewer Authority believes the financial aspects can be equitably worked out. This has been reiterated numerous times. The City of North Myrtle Beach believes, however, it is important to have a firm handle on the financial arrangements prior to commencement of construction. We look forward to working with you, DHEC and the Grand Strand Water and Sewer Authority in moving towards our common objectives.

Sincerely yours,

Doug P. Wendel

Douglas P. Wendel
City Manager

DPW/par

cc: Mayor Bryan Floyd, Hugh Miley, Harry Lockwood, Rayford Vereen

BROOKGREEN GARDENS
A SOCIETY FOR SOUTHEASTERN FLORA AND FAUNA
MURRELLS INLET, S. C. 29576

TELEPHONE
PAWLEYS ISLAND (803) 237-4687

4 May 1977

Mr. John E. Ragan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Dear Mr. Hagan:

Yesterday I saw a copy of the Draft Environmental Impact Statement for the Grand Strand Region, South Carolina, EPA Project No. C450381 and read most of it with interest.

I congratulate you for doing a comprehensive study of the region but am left to wonder why Brookgreen Gardens has been left out of the planning district. All other remote forest and beach areas, no matter what the ownership, are included in the service area. At no time during this study was Brookgreen Gardens contacted about future plans, plans which may be complete before all other remote areas are fully developed.

I also note that in Appendix C, on page A-8, on the second line from the top, "The gardens are now owned by the State of South Carolina and administered by a private board." The fact is that Brookgreen Gardens is not owned by the State of South Carolina but by Brookgreen Gardens, A Society for Southeastern Flora and Fauna and is operated by the Trustees as a charity for the benefit of the public. Huntington Beach State Park is also owned by Brookgreen Gardens and was leased to the South Carolina Forestry Commission in 1960, who later transferred the lease to the Department of Parks, Recreation and Tourism. This lease was made by the Trustees for a period of 50 years without charge.

EPA - IMPACT STATEMENTS
MAY 09 1977
REGION IV

I think it is important that this erroneous statement in the draft be corrected as it casts doubt on the accuracy of the presentations of other matters. I hope more thorough research was conducted in compiling the facts on other facets of the statement.

Enclosed is a copy of a clipping regarding the status of the Murrells Inlet Jetty project which goes into some detail regarding the ownership and operation of Brookgreen Gardens.

Sincerely,

Gurdon L. Tarbox, Jr.

Gurdon L. Tarbox, Jr.
Director

GLT/at

WACCAMAW CHAPTER
South Carolina Wildlife Federation
P.O. Drawer 320, Conway, S.C. 29526 Phone 248-5721 (Ext 45)

April 26, 1977

DIRECTORS, 1977:

. Mitchell Godwin (President)
ayward Ammons
/ayne Graham
. Phil Hucks
enneth C. Inman
ames T. McInvaill
onald J. Millus
herry S. Sawyer (Sec.-Treasurer)
/alter S. Stilley
ack V. Taylor
/illiam B. Woodward

John E. Hagan, III
Chief, EIS Branch
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30308

RE: Project No. C450381

Dear Mr. Hagan:

The Waccamaw Chapter would like to go on record supporting the Environmental Impact Statement on the Grand Strand Region, South Carolina Wastewater Facilities, Project No. C450381, as presented at the public hearing held April 11th at the South Carolina Public Service Auditorium, Myrtle Beach, South Carolina.

We do request, however, that attention be given to the forth coming areas that will be able to be developed as a result of this Wastewater Project. It has been mentioned that our local canals and rivers will be much cleaner and would be able to withstand riverside development for private interests. We would like to go on record opposing any alterations that would take away the rights of the public or seriously hamper the environment as an end result of this project.

Sincerely,

A. Mitchell Godwin
President

AMG:sls
CC: South Carolina Wildlife Federation
Mark Bara, District Biologist
South Carolina Wildlife and Marine Resources Department

EPA [illegible] STATEMENTS
APR 28 1977

AN AFFILIATE OF
SOUTH CAROLINA WILDLIFE FEDERATION

1. Answers to Comments of the Department of the Air Force

a. The final decision on the configuation and size of the project is presented in the FEIS. No final decisions were made in the DEIS.

b. Plants LB-1 and NMB-1 will be able to meet permit requirements. Plants MB-1 and NMB-2 can probably meet BOD5 requirements but not suspended solids. Plant AF-1 will not meet secondary standards.

c. EPA concerns that Plant AF-1 will continue to be manned and operated by Air Force personnel until the plant is phased out.

d. (1) Since no incinerators are proposed, the construction and operation of the project will have no significant impact upon the region air quality.

(2) The increased noise levels expected during project construction will be limited to minor irritation. No one should be affected by the increased noise level at Plant A since the area surrounding this site is uninhabited. There

are about four dwellings near the proposed Plant C site which will be impacted - Relatively large homes on large lots are situated to the northeast and east of the Plant C. site. Wooded undeveloped areas lie to the north, west, and south of the site.

2. Answers to Comments From the U.S. Department of Commerce

If any planned activity will disturb or destroy the geodetic control survey monuments, proper notification and mitigative measures will be taken.

3. Answers to Comments From the Department of Interior

Page 1-5, section 1.2.2 The term "water table" in relation to artesian aquifers should be changed to artesian pressure or piezometric surface.

Page 1-5,section 1-2-3 The contribution to surface water pollution from non-point sources will be addressed in the 208 study now underway.

Page 2-15 EPA concurs that eel grass are not known to exist in the Grand Strand area.

Page 2-22 The analysis presented in Chapter 8 of the DEIS concludes that population growth will not be significantly effected by the project. Therefore, no indirect impacts on groundwater are expected from the proposed action. A detailed description of the groundwater supply situation in the Grand Strand area can be found in the Capacity Use Study conducted by the U.S. Geological Survey.

Page 2-30 Brown and White shrimp spawn offshore rather than in the estuaries.

Page 2-37 The title of Figure 2-6 in the DEIS should be changed to read Freshwater and Saltwater Marshes.

Page 2-64 No part of the proposed facilities will effect the potential Natural Landmark areas. The areas identified are presented in Appendix IV.

Page 2-67 The threatened species list should include the American alligator which is known to occur in the Grand Strand 201 area.

Page 3-45 The methodology and suitability of the survey were approved by the State Archeologist. EPA feels this constitutes an adequate safeguard against any destruction of significant cultural resources by ground disturbance from this project.

Page 7-3 The discussion concerning the destruction of archeological sites by ditches was only met to present a general description of the situation. Archeological surveys have been or will be conducted on all areas of direct project impact. The survey for the Plant G interceptor system is located in Appendix G of the DEIS. The surveys, for the sites for Plant G, and Plant C with their respective outfalls and the outfall from Plant MB-1 are presented in Appendix II of the FEIS. A survey for Plant site A has been completed but a write up is not yet available . Surveys for the Plant A and Plant C interceptor system will be completed in the early stage of the preparation of plans and specifications on these two projects. Page 8-20 The DEIS concluded that the prepared project would have no significant impact upon population growth in the planning area. The reasons for this conclusion are presented in Sections 8.1.1.1 and 8.1.1.2. The estimates of population growth presented on page 8-22 are projected both with and without the proposed project. The impacts of projected growth discussed on page 8-22 are not impacts of induced growth. The DEIS concludes on page 8-31 that the total growth projected for the Grand Strand is expected to occur whether or not the proposed project is initiated. The first sentence in Section 8.3.2 should read "A major impact of projected growth on groundwater..."

The provision of a regionalized wastewater treatment system will put the Grand Strand area in a more competitive position for the attraction of clean industry. However, the land costs in the tourist oriented Grand Strand area are significantly greater than in other areas of the region. Therefore it is doubtful that significant amounts of new industry will locate in the area during the planning period.

8-32 - EPA concurs that the net impact of the proposed project upon the quality of the shallow water aquifers will be beneficial.

9-5 Under section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665) it is the responsibility of the Environmental Protection Agency, prior to the approval of the expenditure of any Federal funds, to take into account the effect the undertaking on any district, site, building, structure, or object that is included in the National Register. Prior to agency decision concerning an undertaking, EPA shall identify properties located within the area of the undertaking's potential environmental impact that are included in or eligible for inclusion in the National Register. To identify properties included in the National Register, EPA shall consult the National Register, including monthly supplements. To identify properties eligible for inclusion in the National Register, EPA shall, in consultation with the appropriate State Historic Preservation Officer, apply the National Register Criteria to all properties possessing historical, architectrual, archeological, or cultural value located within the area of the undertaking's potential environmental impact.

EPA has followed this proscribed procedure in determining that no properties on or eligible for inclusion on the National Register of Historic Places will be effected by the proposed action.

4. Response To Comments From The Department of Health, Education and Welfare

The analysis conducted in the development of the DEIS indicates that the proposed project will not adversely impact the region's community services and facilities. Chapter 8 of the DEIS discusses the effects the proposed project will have on growth and development in the Grand Strand area. The conclusion reached is that the estimated growth attributable to the system is essentially the same amount of growth expected to occur under the no action alternative. Therefore, the projected growth rate of demand for community services and facilities will be the same whether or not the project is constructed. It is expected that the increase in demand will be large and should be planned for now by the communities involved. However, this increase will not occur as a result of the proposed wastewater treatment facilities and will not be discussed in detail in the EIS.

5. Response To Comments From The Department of Housing and Urban Development

No response required.

6. Answers To Comments From the Department of The Army

No response required.

7. Response to Comments From The State Clearinghouse

No response necessary.

8. Response to Comments From The South Carolina Department of Health and Environmental Control

1.3.1 The boundaries of the service areas are shown on Figure 1-2 in the DEIS and Figure 1 in the FEIS.

2.1.3 The first line on page 2-8 should refer to the Intracoastal Waterway rather than the Waccamaw River.

2.3.3-4 The only wetland area to be affected by the project will be along the outfall routing of Plant G near the Waccamaw River (see vegetative survey in Appendix III). Appropriate mitigative measures such as upland disposal of disturbed soil and re-vegetation will be taken to insure that no significant adverse impacts will occur.

2.3.5 The information on shellfish closing included in the DEIS is currently accurate.

3.11.4 Appendix II in FEIS includes archeological surveys on the sites and outfall lines for Plant A, Plant G, and Plant C and the new outfall for Plant MB-1. Appendix III contains a vegetative survey for the new Plant G outfall. Archeological and vegetative surveys will be conducted for the Plant A and Plant C interceptor systems during the early stages of Step II work on these projects.

4.3.5 Since the ratings were done on the original group of 13 alternatives, additional significant information has been developed largely related to water quality conditions in the ICWW and Waccamaw River. This information has greatly limited and altered the viable alternatives for treatment and disposal of wastewater. For this reason, it would not be beneficial to generate more detailed information concerning the original evaluation.

Section 5 The projected design year flow for Plant MB-1 has been increased from 9.0 mgd to 12.0 mgd.

8.3.6(2) Average noise levels for different types of environmental conditions are shown on Figure 8-1. Noise levels in much of the Grand Strand area should be in the range from 45 to 50 Ldn. The more highly developed areas along the beach are probably in the area of 65 Ldn during major holiday periods. All three of the proposed treatment plant sites have noise levels in the 45 Ldn range.

9. Response To Comments of the Bureau of Air Quality Control

EPA concurs with the data presented by the South Carolina Bureau of Air Quality.

10. Response To Comments From South Carolina Land Resources Conservation Commission

The local county Soil and Water Conservation District will be contacted for technical assistance in the preparation of a sediment and erosion control plan.

11. Response To Comments From The South Carolina Water Resources Commission

2.1.3 As the DEIS notes on page 2-7, the normal flow of the Intracoastal Waterway is from south to north.

2.1.8 Eladea is a serious pest in some areas.

2.3.3, p. 2-32 Low marshland occurs from mean low water to about mean high tide.

2.3.3, p. 2.36 The appendix referred to is not presented in the DEIS or FEIS.

2.3.4 Appendix B provides a list of common birds which frequent one or more types of coastal salt marsh. Many of these same birds are also present in freshwater marshes. More detailed lists should be available from university departments and local wildlife conservation groups.

1.2.2 1) Clarification noted.

1.2.2 2) Clarification noted.

1.2.2 3) Correction noted.

1.2.2 4) The "Capacity Use Study" conducted by the U.S.G.S. should have the most up to date information concerning aquifer contamination.

2.2 1) The "Capacity Use Study" will be published in 1977.

2.2 2) On page 2-24 the DEIS concurs that few wells have been completed in the Tuscaloosa aquifer.

2.2 3) Correction noted.

2.2 4) Correction noted.

12. Response To Comments From Pee Dee Health Systems Agency

No response necessary.

13. Response To Comments From the South Carolina Department of Archives and History

No response required.

14. Response To Comments From The South Carolina Wildlife and Marine Resources Department

(1) Figure 2-1 does not indicate water usage class of each water system in the planning region as indicated on page 2-2 of the DEIS. This information is however, presented in the discussion on page 2-2.

(2) The Pee Dee River has a major influence on the characteristics of the ICWW during low flow periods of the Waccamaw.

(3) Figure 2-2 is a map of sampling stations in a beach study area rather than a map showing areas served by various wastewater treatment facilities.

(4) Correction noted.

(5) Correction noted.

(6) EPA recognize the importance of artificial reefs and line bottom areas to offshore sports fishermen.

(7) Correction noted.

(8) The shellfish growing areas in North Inlet, Pawleys Island, and Little River are indicated on page 3-34.

(9) EPA concurs that approximately half of the detritus produced by a salt marsh is exported to estuaries in the area under consideration.

(10) The proposed project described in the EIS will not have any significant adverse impact upon wetlands in the project area. EPA is vitally concerned with the protection of wetlands and recommends that care be taken to prevent their destruction as development continues in the Grand Strand area.

(11) The title of Figure 2-6 should be changed to read "Marshes".

(12) Omission noted.

(13) Omission and correction noted.

(14) The American alligator is found in the Grand Strand area.

15. Response To Comments From The Town of North Myrtle Beach

A response to this comment is given in Chapter III in response to Mr. Wendel's comment at the public hearing.

16. Response To Comments From Brookgreen Gardens

(1) Brookgreen Gardens will be included in the service area for Plant C.

(2) Brookgreen Gardens is not owned by the State of South Carolina but by Brookgreen Gardens, a Society for Southeastern Flora and Fauna and is operated by the Trustees as a charity for the benefit of the public. Huntington Beach State Park is also owned by Brookgreen Gardens and was leased to the State of South

Carolina in 1960 for a period of 50 years without charge.

17. Answers to Comments of the South Carolina Wildlife Federation

Construction of the proposed project will cause the alleviation of existing adverse conditions caused by low quality wastewater discharges. The project will not take away any rights of the public or seriously hamper the environment. Page 2-63 of the DEIS identifies sensitive natural areas located in the Grand Strand area. The project will not adversely affect any of these areas.

CHAPTER V

AGENCY DECISION

The proposed projct consists of the construction of three new wastewater treatment facilities with accompanying outfall lines and interceptor systems and the upgrading and expansion of existing plant MB-1. Plant A will be a 6.0 mgd facility discharging into the Intracoastal Waterway. Plants G, C, and MB-1 will have first phase capacities of 6.0 mgd, 2.8 mgd and 12.0 mgd respectively discharging into the Waccamaw river. The costs, phasing, and treatment levels are presented in Table I of this FEIS.

Special conditions on the grants will require the following:

1. The completion and approval by the State Historic Preservation Officer and State Archeologist of archeological surveys on all remaining segments of the project during the design phase of these segments.
2. Vegetative surveys on the Plant A and Plant C interceptor systems, and the Force Main from Plant MB-1 to Plant G must be completed and approved by EPA during the

design of these systems.

3. A signed contract for specific sites for sludge disposal and approval by SCDHEC's Director of Solid Waste of specific sludge disposal sites for use by each of the three new plants must also be obtained before additional grants are awarded on these projects.

4. All new grants being awarded as a result of this EIS will be conditioned upon the receipt by EPA of an implementation schedule and/or application to provide sewer service to the Murrells Inlet area of the Grand Strand.

APPENDIX I

WASTE LOADS AND CONDITIONS FOR DISCHARGES TO THE ICWW

BOARD MEMBERS
Lachlan L. Hyatt, Chairman
William M. Wilson, Vice-Chairman
I. DeQuincey Newman, Secretary
W. A. Barnette, Jr.
Leonard W. Douglas, M.D.
J. Lorin Mason, Jr., M.D.
William C. Moore, Jr., D.M.D.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

E. KENNETH AYCOCK, M.D., M.P.H., COMMISSIONER
J. MARION SIMS BUILDING — 2600 BULL STREET
COLUMBIA, SOUTH CAROLINA 29201

May 23, 1977

George White, Project Manager
Water Programs Division
Environmental Protection Agency
Region IV, 345 Courtland Street, NE
Atlanta, Georgia 30308

Dear Mr. White:

The South Carolina Department of Health and Environmental Control recommends the following waste loads and conditions for dischargers to the Grand Strand area of the Intracoastal Waterway.

1. Plant A North Myrtle Beach: 10 mg/1 BOD$_5$, 2 mg/1 ammonia, discharge 6 mgd.
2. Myrtle Beach - 1: No discharge at present site.
3. Plant G/MB-1 at proposed discharge point (Node 43 on ICWW Model): This site can assimulate 7 mgd of secondary effluent or a maximum allowable discharge of 6400 lbs/UOD/day.
4. Plant G/MB-1 with discharge point at Node 48 of ICWW Model: 20 mgd at secondary treatment of 30 mg/1 BOD$_5$.

We have yet to complete the transition of the ICWW Model to our computer facilities and therefore, have not made first-hand computer runs.

The above recommendations are, however, consistent with our assessments made using the information now available.

If I can be of further assistance, please call.

Sincerely,

J. C. Hawkins, Chief
Bureau of Wastewater and
Stream Quality Control

JCH/LEM/cep

cc: Roger Davis
Bob King
Larry McCullough

APPENDIX II

ARCHELOGICAL SURVEYS

REPORT
on an
ARCHAEOLOGICAL SURVEY
and
CULTURAL ASSESSMENT

of an area
Located in
Socastee Township, Horry County
South Carolina
to be affected
by
the construction of
A New Wastewater Treatment Plant
for Area G
of
THE FINAL PLAN FOR THE REGIONAL WASTEWATER FACILITIES
of the Grand Strand Region
by
Black, Crow, and Eidsness, Inc.

conducted by

Reinhold J. Engelmayer, PhD
Professional Archaeologist
November 17, 1976

INTRODUCTION

The archaeological assessment was undertaken in behalf of Black, Crow, and Eidsness, Inc., consulting engineers (4508 St. Andrews Road, Suite 17 - 18, Columbia, South Carolina), and the Grand Strand Water and Sewer Authority (Conway, South Carolina). The area investigated is the proposed site for a new sewage treatment plant to process sewage from Area G of the Grand Strand Wastewater Facilities Plan. This survey and Cultural Resources Assessment was necessary due to the change of the location of the proposed treatment plant from its planned location south of the county road leading from Racoon Run Golf Course to Freewoods to its new proposed location. (see survey map and R. Engelmayer June 9, 1976) The environmental impact study was carried out by Dr. Reinhold Engelmayer and one field assistant.

DESCRIPTION OF AREA

The area is located west of Highway 544 in Socastee Township, Horry County, South Carolina, east of the Waccamaw River and consists of 25.5 acres owned at present by Eddie Williams and Betty Williams, who have proposed to convey it to the Grand Strand Water and Sewer Authority.

The area investigated consists of an 866.9 foot long access road 50 feet wide located at the west end of the property line of afore mentioned owners from the County Road north 45 degrees 30' west and an area for the proposed sewage plant approximately 1,060 feet by 1,060 feet. The area is overgrown with tall grass and weeds with scattered long leaf pines. The area is wet with a foot of standing water towards the middle of the construction area, due to a gray clay base 30 to 50 cm below the surface (see plate I and II). On the left side of the access road about 100 feet from the county road there is a small thicket of hardwood and pine separated from the access road by a wire fence. Few insect eating plants are found in this area due to its modern useage as a cow pasture.

Due to the fine textured soil, there is little or no subsurface water movement and therefore the owners have tried to drain the area by means of large surface ditches which run along south of the proposed plant area to the east of it and through the northern part of the proposed construction area. The afore mentioned county dirt road is also one of the watershed boundaries (Feasibility Study 1975, sheet 11).

Geologically the area is part of the Myrtle Beach Formation, which is dated according to Jules R.DuBar into the Late Pleistocene (J.R.DuBar; 1971, p.4 and 7). In the southwestern part of the Waccamaw Neck the backbarrier flat merges with the fluvial terraces and sediments of the ancient Waccamaw River. J.DuBar estimated a thickness of the underlying basis of tight clay with a thickness of 6 to 10 feet. A drill hole drilled by H.S. Johnson for the Division of Geology, S.C.State Development Board on June 14, 1965 with a power auger to a total depth of 31 feet at a spot at the very end of the county road leading to the Waccamaw River (Hole # 159, Drill Records, USGS, Conway Office) confirms these data. He encountered from 0 - 5' sandy, plastic, moist clay of orange brown color, from 5 - 8' sandy, plastic moist, creamy clay of gray color, from 8 - 27' soupy, slighlty yellow and shelly sand, yellow in the upper portions and becoming greenish gray downward, the sand contained very sparse tiny shell fragments. At 27 feet he encountered sediments of the Pee Dee Formation, consisting of marl or calcareous clayey sand of very dark greenish gray color, at 31' his drill hole ended on a hard cemented bed. He encountered at a collar elevation of 22' the water table already at 4'.

Our own drill holes drilled with a hand auger confirmed his results for the area of the proposed construction site of the sewage plant (see plate III).

DOCUMENTARY EVIDENCE

An Archive research of all available historic maps for this area and interviews with tenants living close by to the affected area did not turn up any evidence for any prehistoric or historic sites once located in the affected area. A survey of the files of the Archaeological Site Survey of the Institute of Archaeology and Anthropology of the University of South Carolina and the files of the Horry County Archaeological Site Survey proved negative also.

ARCHAEOLOGICAL RESEARCH PLAN

After examination of historic and contemporary maps and records, aerial photographs, soil maps, and geological records, an on-the-ground survey was decided upon.

THE SURVEY

The area to be affected by the construction of a new sewage plant and access road was surveyed archaeologically on October 27. The survey was conducted by Dr.Reinhold Engelmayer and one assistant. The ground was found to be standing in most of the area of the plant construction site under water 5 to 10 cm deep. Only the access road was reasonably dry due to its slight elevation(plate I and II).

Exposed profiles along the county dirt road where the access road to the plant is supposed to begin (plate I/1) (plate III/profile 1, see also map) and along the two ditches travesring the area of the construction site of the sewage plant (profile 2 and 3, see plate III/profile 2 and 3, and also map) where checked and measured, however no cultural remains or artefacts were observed.
An open ground survey was conducted over 90 % of the suface of access road and plant area, with equally negative results as far as cultural remains and artefacts were concerned.
In addition three core samples on the access raod and five core samples in the plant area were taken with a three inch hand auger. The results confirmed the geological data expected from previous geological drilling mentioned before in this report.
Not a single site of prehistoric or historic origin, nor a single artefact was located by the survey and sampling. A description of the drill samples is compiled on plate III.

LIMITATIONS OF THE SURVEY

No limitations as far as survey plan or actual survey are concerned existed. Standing water on the surface in most of the area investigated did not affect the accuracy of the on-the-ground search nor the core drilling. Vegetation did not pose any problems, since modern usage as a cow pasture has reduced the ground vegetation to mostly grass.

ARCHAEOLOGICAL VALUE OF THE SURVEY

No sites of prehistoric or historic times will be endangered by the project. As far as it could be determined by the archives research and the actual survey this area has not been occupied during prehistoric or historic times in any significant way, indicated by the complete absence of any artefacts or evidence of cultural remains. As indicated by remains of cypress stumps in the profiles 2 and 3 this area was too wet to provide any suitable habitat before modern times. Eøven the construction of drainage ditches in recent years has not improved the area to such a degree, that it could be used for more than a cow pasture.

SUMMARY AND RECOMMANDATIONS

No sites of prehistoric or historic age are located in the area affected by the proposed construction of a sewage plant and an access road as far as it could be determined. The project therefore as planned and surveyed will have no adverse effect on any cultural remains. No further mitigation is necessary.

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3. Engelmayer, R., *Report on an Archaeological Survey in Regard with prehistoric and historic sites located in Horry and Georgetown County of South Carolina to be affected by the construction of the Central Wastewater Treatment Plant,Phase I.*, Pawleys Island, June 9, 1976 (Coastal Carolina Archaeological Field Station Research Report # 5)

4. *Feasibility Study of Requirements for Main Drainage Canals, Horry County, South Carolina*, Government publication number 4-34739 2-75, United States Department of Agriculture, Soil Conservation Service, Fort Worth, Texas . 1975.

This report is filed as research report # 8 at the Coastal Carolina Archaeological Field Station, Pawleys Island, South Carolina.

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PLATE III

Soil Profiles and Drill Holes on Access Road and Plant Site

DESCRIPTION

Profile 1:

0 - 20 cm black damp topsoil with grass roots
20 - 38 cm dark brown sand mixed with topsoil, traces of iron oxyde
38 - 50 cm plastic, moist creamy clay, grey color with streaks of iron oxyde
50 - 67 cm plastic, moist, creamy clay, yellow with streaks of grey clay
67 - 80 cm plastic, moist, yellow clay with red iron oxyde streaks
Watertable at 65 cm

Profile 2:

0 - 20 cm black humus mixed with brown sand, containing grass roots
20 - 75 cm plastic, moist, creamy clay with yellow streaks of iron oxyde
75 - 90 cm increasingly yellowish clay, moist, and creamy, remains of cypress stumps at this level.
Watertable at 75 cm

Profile 3:

Identical to profile 2. Watertable at 80 cm

Drill Hole # 1

0 - 18 cm black, damp topsoil with grass roots
18 - 35 cm damp topsoil mixed with brown sand
35 - 50 cm moist, plastic, creamy clay, grey color with streaks of yellow iron oxyde
50 - 80 cm moist, plastic creamy clay, yellow with steraks of grey, ironoxyde.
Watertable at 68 cm

Drill Hole # 2

0 - 13 cm black moist topsoil with sand of medium grain mixed in, grassroots
13 - 30 cm moist yellow clay with grey streaks, organis material and roots
50 - 95 cm moist yellow clay with grey straeks and iron oxyde
Watertable at 60 cm

Drill Hole # 3

0 - 20 cm sandy dark brown humus with grass roots, dry
20 - 35 cm dark brwon sand, mixed with humus and grey clay, some iron oxyde
35 - 90 cm grey clay with streaks of yello, moist plastic and creamy
Watertable at 60 cm

Drill Hole # 4

0 - 22 cm dark moist topsoil with some sand and grassroots
22 - 75 cm moist, plastic, creamy clay with yellow streaks and iron oxyde
75 - [illegible] cm greyish, moist, plastic, creamy clay with iron oxyde
Watertable at 60 cm

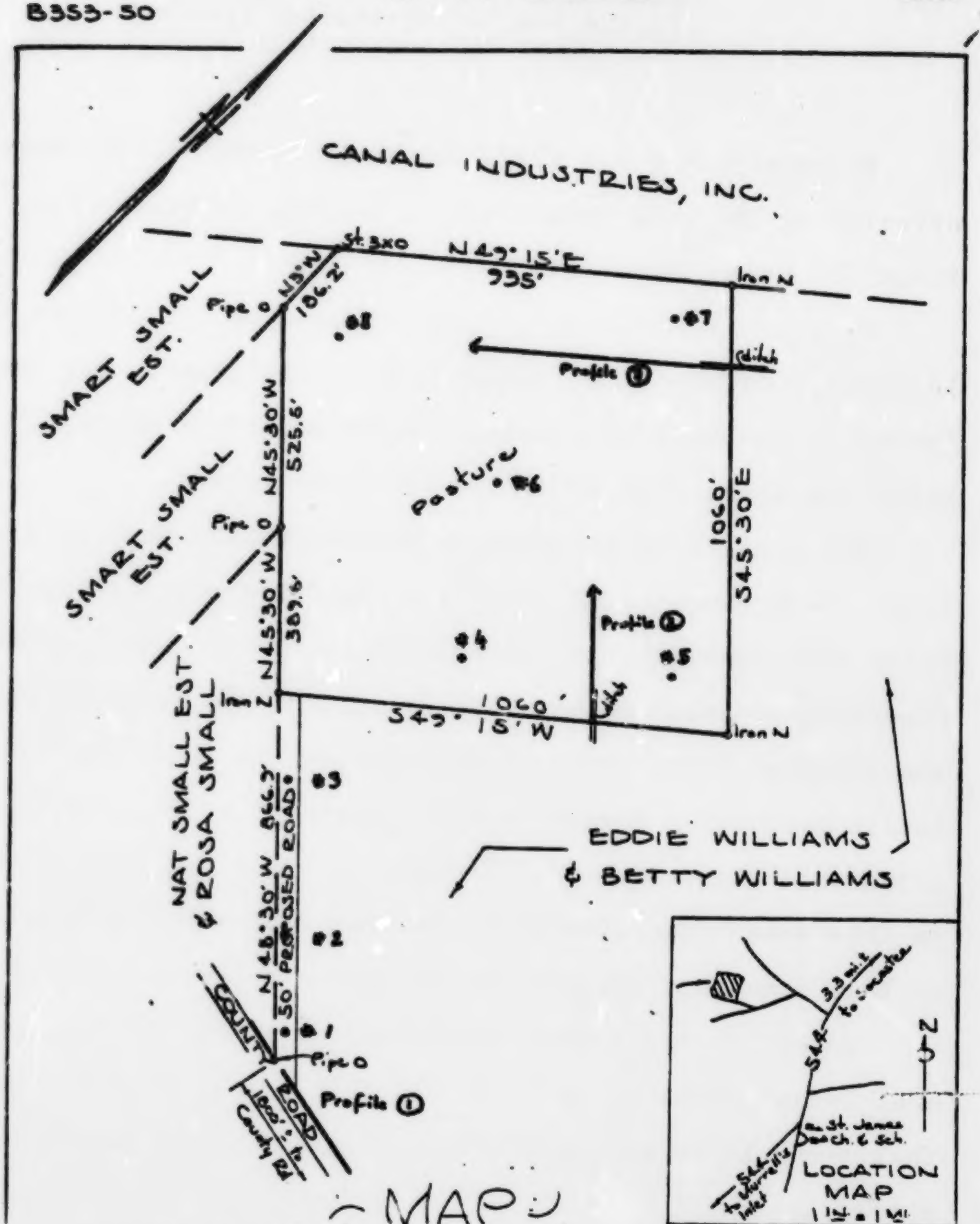
Drill Holes # 5 - # 8

Identical to # 4

B353-50

WWTP Area G

MAP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St. 3x0
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SMART SMALL EST.
SMART SMALL EST.
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106.2'
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1060'
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50' PROPOSED ROAD
•#3
•#2
•#1
Pipe o
Profile ①
COUNTY ROAD
to County Rd. 1007
EDDIE WILLIAMS
& BETTY WILLIAMS
544
3.3 mi. to Socastee
N
St. James Ch. & Sch.
544 to Murrell's Inlet
LOCATION MAP
1 IN. = 1 MI.

MAP

OF 25.5 ACRES OF LAND IN SOCASTEE TOWNSHIP, HORRY COUNTY, S.C. WHICH EDDIE WILLIAMS & BETTY WILLIAMS PROPOSE CONVEYING TO THE

GRAND STRAND WATER & SEWER AUTHORITY

RE: MAP BY S.D. COX, JR., R.L.S., DATED SEPT. 30, 1963 FOR HEIRS OF SYE SMALL (E-121)

OCTOBER 27, 1976

300 150 0 300 600
SCALE IN FEET

S. D. COX SURVEYORS, INC.
P.O. BOX 832
CONWAY, S.C. 29526

BY S.D. Cox, Jr. R.L.S. No. 961

6-E-12

Field Report of Archaeological Survey
In the area of Wastewater Treatment
Plant "C" and Outfall

On Monday, May 23, 1977, the field survey of the area to be affected by the enlargement of and outfall of Wasterwater Treatment Plant "C" began (Phase II).

We started by investigating the area of the present WWTP, at Litchfield Country Club, which is to be enlarged. The present plant (which is enclosed by a fence) stands on fill dirt brought in to raise the plant area above the low areas around.

The area to be affected by planned enlargement is a low swampy area. Major vegetation observed: Bald Cypress, Cabbage Palmetto, Water Oak, Sweetgum, Southern Magnolia, Water Tupelo, Sweetbay, Flowering Dogwood and American Holly. In the area adjacent north to the existing WWTP, Southern Magnolia was in great abundance (a Plantation garden?). However archive research of the existing plats of Litchfield Plantation (as far back as 1794) did not show any gardens in this area. Two subsurface samples were taken with a hand auger in this area, but no evidence of cultural remains were found.

No artifacts, either prehistoric or historic were found in this area (enlargement of WWTP C). At this point, it can be safely assumed that there is no danger of disturbing any archaeological sites on this site.

Following the planned outfall of the plant along an existing dirt road, artifacts are infrequent and consist of a few pieces of oyster shell, colonial sherds, and small pieces of colonial brick. All these artifacts were found in the freshly plowed roadway, not in situ.

Close to the road entrance of the Litchfield Plantation gate, a large Paleo-Indian end scraper was found on the north side of the same dirt road. The material is fossil chert and the working marks are distinct.

On the South side of the dirt road a few scattered pieces of sand tempered prehistoric pottery were found indicating a possible site. A 1m x 1m test square was dug to a depth of 60cm below surface. One piece of plain pottery and one end rhyolite tool was found. However no extensive site can be expected.

Continuing down the outfall into Litchfield Plantation no other sites were encountered until reaching the present marina at Litchfield Plantation. On the South side of the roadway leading from the Plantation house to the marina are the remains of a colonial rice mill which was operated by Mr. John Tucker in the 19th century. This rice mill is a very valuable piece of history and would be affected adversely by the installation of an outfall line. However, the outfall can be safely moved to the north side of the road.

Continuing from the marina, following an old rice dike ~~formly~~ from the colonial period, no artifacts or features are noted except for an island about 500 yards to the south of the rice dike. This island merits further investigation as it could be a shell mound. However this island would not be adversely affected by the proposed outfall.

On June 1, 1977, the area of the outfall into Waccamaw river was surveyed under water. Scuba gear was used and the area was well searched. There were no artifacts noted in this area. With the exception of a slight change in the outfall in the area of the historic rice mills, no important archaeological site would be affected by Phase II of the WWTP - Plan (Area C).

Dr. Reinhold Engelmayer
Professional Archaeologist

APPENDIX III

VEGETATIVE SURVEYS

PLANT COMMUNITIES

VEGETATION STUDY ALONG PROPOSED ROUTE FOR SEWER LINE

PREPARED FOR
MR. GLENN DUKES
BLACK, CROW & EIDSNESS, INC.
ENGINEERS
GAINESVILLE, FLORIDA

JUNE 7, 1977

BY
JOHNNIE E. BRIGMAN
REGISTERED FORESTER
NO. 540

VEGETATION STUDY ALONG PROPOSED ROUTE FOR SEWER LINE

Vegetation from Cypress Creek wastewater treatment to Stalvey/Pine Island Road.

The actual route for the twelve inch sewer line from Cypress Creek wastewater treatment plant was sampled. The area from the plant site to the power line right-of-way appeared to have been logged in the past 5 to 7 years. Scattered loblolly pine, Pinus taeda, 10 inches in diameter at breast height (DBH), 56 feet total height, predominated. Near the power line right-of-way a small depression with some standing water was encountered. The predominate species in this area were sapling sized sweetgum, Liquidambar styraciflua, scattered blackgum, Nyssa sylvatica, and persimmon, Diospyros virginiana.

Under the power line right-of-way to Stalvey/Pine Island Road the vegetation was predominately sprout growth of various species: blackgum, sweetgum, red maple, Acer rubrum, and swamp cyrilla, Cyrilla racemiflora. A few loblolly pine and pond pine, Pinus serotina, seedlings were noted. The lower vegetation consisted of numberous annual grasses, gall berries, blackberries and muscadine vines.

Vegetation along Stalvey/Pine Island Road

The proposed twelve inch sewer line runs down Stalvey/Pine Island Road for approximately three miles. Since the road is well traveled there was no vegetation in the road itself. The road right-of-way had various annual grasses that normally invade a previously disturbed site. No infrequent or rare species were noted along the entire road. Both sides of the road alternated between planted loblolly pine and fallow or cultivated fields.

Vegetation from Forestbrook wastewater treatment plant to Stalvey/Pine Island Road.

From the Forestbrook wastewater treatment plant, the proposed twelve inch sewer line passed through a small swampy area. The predominate species in the area were sweetgum, blackgum, persimmon and to a lesser extent Baldcypress, Taxodium distichum, water oak, Quercus Nigra, and willow oak Quercus phellos. This area was relativly small and changed to an area of scattered loblolly pine with various species such as wild cherry, Prunus serotina, sweetgum, persimmon, and red maple. The proposed line then makes a turn down a drainage ditch to the Stalvey/Pine Island Road. Both sides of the drainage ditch were in second growth loblolly pine. Most of this pine was young, under 15 years of age.

Vegetation from Stalvey/Pine Island Road to Intracoastal Waterway

Through this area the proposed sewer line will follow the road right-of-way. This area is almost entirely second growth loblolly pine 10 inches DBH and 50 to 60 feet total height. Along the ditch banks were common annual grasses. Occasionally, wild blackberries, sweetgum, and myrtle, Myrica cerifera, were observed along the ditches on either side.

The vegetation began to change about 1300 feet from the Intracoastal Waterway as the site became more xeric. The area appeared to have been a spoil area. Woody species present consisted of wild cherry, sweetgum, smooth sumac, Rhus glabra, persimmon, wild plum, Prunus americana, southern red cedar, Juniperus silicicola. Various annual grasses along with muscadine, and trumpet creeper were also present.

Vegetation from Intracoastal Waterway down power line right-of-way to Highway 544

The area under the power lines showed evidence of repeated mowing and probably some chemical control of vegetation. Most woody plant growth was from root sprouts. Species present include sweetgum, persimmon, red maple, loblolly bay, Gordonia lasianthus, green ash, Fraxinus pennsylvan var. lanceolata, river birch, Betula nigra, black willow, Salix nigra, black gum, Nyssa sylvatica, poison ivy Toxicodendron radicans, sassafras sassafras albidum, dogwood, Cornus florida, American holly, Ilex opaca, blackjack oak, Quercus marilandica, southern red oak, Querous falcata, and willow oak. Some loblolly and pond pine seedlings were also present. Various annual grasses and sedges were also interspersed with the woody species.

As previously noted most vegetation in the area was from root sprouts and no unique, rare, or endangered species were observed.

Vegetation along roadway from Cimarron to Highway 707

The area near the plant was low. The predominate species being sweetgum, and persimmon with some green ash and pond pine along the roadway near the plant. The land rose slightly nearing Highway 707. As the site became drier loblolly pine predominated.

Conclusions

Based on this vegetation study, the constuction of the sewer line will cause no significant damage to the plant environment by following road right-of-ways and power line easements. Only very short lines must be cut through relatively undisturbed areas. No unique, rare, or endangered species were noted along the entire proposed route. Following constructi the plant communities will quickly reestablish themselves along the impacted area.

PLANT COMMUNITIES

VEGETATION SURVEY ALONG PROPOSED EFFLUENT FORCE MAIN FROM GRAND STRAND WATER & SEWER AUTHORITY'S REGIONAL WASTEWATER TREATMENT PLANT

PREPARED FOR
MR. GLENN DUKES
BLACK, CROW & EIDSNESS, INC.
ENGINEERS
GAINESVILLE, FLORIDA

JUNE 30, 1977

BY
JOHNNIE E. BRIGMAN
REGISTERED FORESTER
NO. 540

NO.540

VEGETATION SURVEY ALONG PROPOSED EFFLUENT FORCE MAIN FROM GRAND STRAND WATER & SEWER AUTHORITY'S REGIONAL WASTEWATER TREATMENT PLANT

Introduction.

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This paper addresses itself to the proposed route of the effluent force main from Grand Strand Water and Sewer Authority's regional wastewater treatment plant. For the purpose of this survey, the study was initiated at a point just north of Mr. Ford Wells swine lot on Craig Wall Road. This point was chosen to ensure some overlap with the original vegetation survey. The actual route the force main would follow was sampled. Plots were taken every 10 chains or at each ecotone.

Vegetation Along Craig Wall Road Mr. Ford Wells Swine Lot to Mr. W.L. Jordan's House.

The proposed effluent force main would remain in the road right-of-way along the entire segment. The total length of force main in this segment would be approximately 2000 feet. Loblolly pine, Pinus taeda, was the dominate timber species along the route. Scattered loblolly pine 18 to 22 inches in diameter at breast height (d.b.h.) and 90 feet total height were observed. These were probably old property line trees before the individual tracts were consolidated. In any event, the few individuals were located well off the road-right-of-way and would not be impacted by the construction of the effluent line. Other species noted along the right-of-way were: sweetgum, Liquidambar styraciflua,smooth sumac, Rhus glabra,American holly, Ilex opaca,water oak, Quercus nigra, wild cherry, Prunus serotina,black willow, Salix nigra, yellow poplar, Liriodendron tulipifera,and post oak, Quercus stellata. Occasionally white mulberry, Morus albe,swamp cyrilla, Cyrilla racemiflora and American elderberry, Sambucus canadensis were observed. Near the swine pens, chinaberry, Melia azedarach, pecan Carya illinoensis and a small live oak, Quercus virginiana were observed. Due to the "rooting" by the swine, most of the lesser vegetation had been destroyed, and the ground was essentially bare. Along the road right-of-way past the swine pens were blackberry, virginia creeper, Parthenocissus quinouefolia, greenbrier, Smilax rotundifolia and various annual grasses.

Vegetation along Collins Creek Church Road from Mr. W.L. Jordan's house to Woodstock Road.

This 1300 feet section of road was well traveled with any vegetation being on the extreme edge of the road right-of-way. Only small saplings and sprouts were present. Species observed included swamp cyrilla, sweetgum, and persimmon, Diospyros virginiana. Various annual grasses along with some loblolly pine seedlings were also observed.

Vegeation along Woodstock Road to Pages Rice Field.

The area surveyed was approximately 3 miles. Again, the proposed route was along the road right-of-way. This entire area was in econd growth loblolly pine either in natural stands or plantations. These areas were well off the right-of-way, and would not be impacted by the construction of the new effluent force main. Vegetation along the extreme edges of the right-of-way consisted of inkberry, *Ilex glabra*, loblolly bay, *Gordonia lasianthus*, red maple, *Acer rubrum*, blackjack oak, *Quercus marilandica*, bluejack oak, *Quercus incana*, persimmon, winged sumac, swamp cyrilla, and American holly. Various annual grasses, sedges, squaw huckleberry, *Vaccinium stamineum*, blackberry, and poison ivy, *Toxicodendron radicans* were also observed.

Vegetation Across Pages Rice Field to Waccamaw River/Intracoastal Waterway.

The proposed route across Pages Rice Field to the Waccamaw River/Intracoastal Waterway had not been firmed at the time the vegetation survey was completed. Two routes across the rice field were proposed, one parallel to the Horry/Georgetown County line, and the other a more southerly route. Both routes begin at the extreme westerly edge of the pine plantation at the end of Woodstock Road and proceeds to the Waccamaw River/Intracoastal Waterway. A survey of the vegetation along both routes was conducted. The route parallel to the county line was along an old rice field ditch much of the way. The vegetation on the ditch shoulder consisted of a variety of species indigenous to areas with high water tables. Blackgum, *Nyssa sylvatica*, bald cypress, *Taxodium distichum*, and water tupelo, *Nyssa aquatica*, were the dominate species. Occasionally, low willow oaks, *Quercus phellos*, were observed. Along the sides of the ditch much of the way was marsh-grass, *Spartina sp*. Three small creeks were encountered before reaching the Waccamaw River/Intracoastal Waterway.

The more southerly route was similar to the westerly route with the exception there was significantly less timber species and more marsh-grass. Part of the route appeared to be an old drainage ditch that had almost disappeared. The two routes were similar, with the southern route being significantly shorter.

Conclusion

Based on this vegetation survey, the construction of an effluent force main will cause no significant damage to the plant environment or plant communities by following the road right-of-way. The area known as Pages Rice Field was under cultivation at some time in the past, but now is fallow. The choice between the two routes across Pages Rice Field remains a moot question as far as the vegetation is concerned. No unique, rare, or endangered species were noted along the entire proposed corridor. The plant communities will quickly reestablish themselves following construction in the impacted areas. No permanent damage is expected.

APPENDIX IV

NATURAL LANDMARK AREAS

PRIORITY RATING: P = 2 299

NAME OF SITE: BELLEFIELD PLANTATION (Belle W. Baruch Research Foundation)

ONE-LINE DESCRIPTION: One of the very few relatively undisturbed and unpolluted estuaries and marshlands on east coast.

THEME/SUBTHEME CLASSIFICATION: 8, 24, 29, 30/A, M, Nd

LOCATION: Georgetown County, SOUTH CAROLINA

LATITUDE - LONGITUDE: 33° 20' North/ 79° 10' West

USGS QUADRANGLE REFERENCE: Georgetown, SC 1:250,000

SIZE: 17,500 acres

OWNERSHIP: Private foundation-Belle W. Baruch Research Foundation. University of South Carolina has responsibility of marshland management except S.E. portion of East marsh owned by Mr. T. F. Yawkey.

ADMINISTERING AGENCY:

CURRENT LAND USE: Management of forests, marshlands, research on ecology, oyster fishery. New permanent lab facility (5,000 sq.ft.) at Oyster Landing.

DANGERS TO AREA OR VULNERABILITY:

Immediate landowner to north wants to develop land for exclusive homes and marinas. If permitted to dredge, this could have adverse effects on what is now a pristine estuary.

SENSITIVITY OF AREA: None

SIGNIFICANCE OF AREA:

Former property of Mr. Bernard Baruch. The North Inlet estuary and adjacent salt marshlands are an ideal location for an estuarine sanctuary. The Foundation is dedicated to conservation, marine biology, and forestry. Estuary is quite unpolluted and undisturbed.

PHYSICAL CHARACTERISTICS:

Estuary fringes Waccamaw Neck, including marsh facing Winyah Bay and Rabbit and Hare Islands. Depth variable with tidal stages from few centimeters to 7 meters.

OUTSTANDING GEOLOGICAL FEATURES:

Holocene sediments of silt, clay, fine sand and organic debris overlaying Pleistocene sediments.

ECOLOGICAL DESCRIPTION:

There are four major marsh areas: East Marsh (approx. 7432 hectares); Polyhaline-mesohaline tidal salt marsh bounded on the west by Waccamaw Neck and Winyah Bay, to the east by Debidue Beach, the Atlantic Ocean and North Island, to the north by the Baruch Foundation property line (approx. 33° 21' North lat.), to the south by North Island. West Marsh (approx. 787 hectares); Oligohaline-mesohaline tidal salt marsh bounded on the west by Winyah Bay, to the east and south by Waccamaw Neck to the north by U.S. 17. South Marsh (approx. 509 hectares); Mesohaline salt marsh bounded on the west, north and east by Waccamaw Neck, on the south by Winyah Bay. Rabbit and Hare Islands (approx. 135 Hectares); Oligohaline-mesohaline tidal salt marsh surrounded by Winyah Bay.

DOMINANT SPECIES OF PLANTS: Not Known

DOMINANT SPECIES OF WILDLIFE: Not Known

RARE OR ENDANGERED SPECIES OF PLANTS OR WILDLIFE: Not Known

SCIENTIFIC REFERENCES ON AREA:

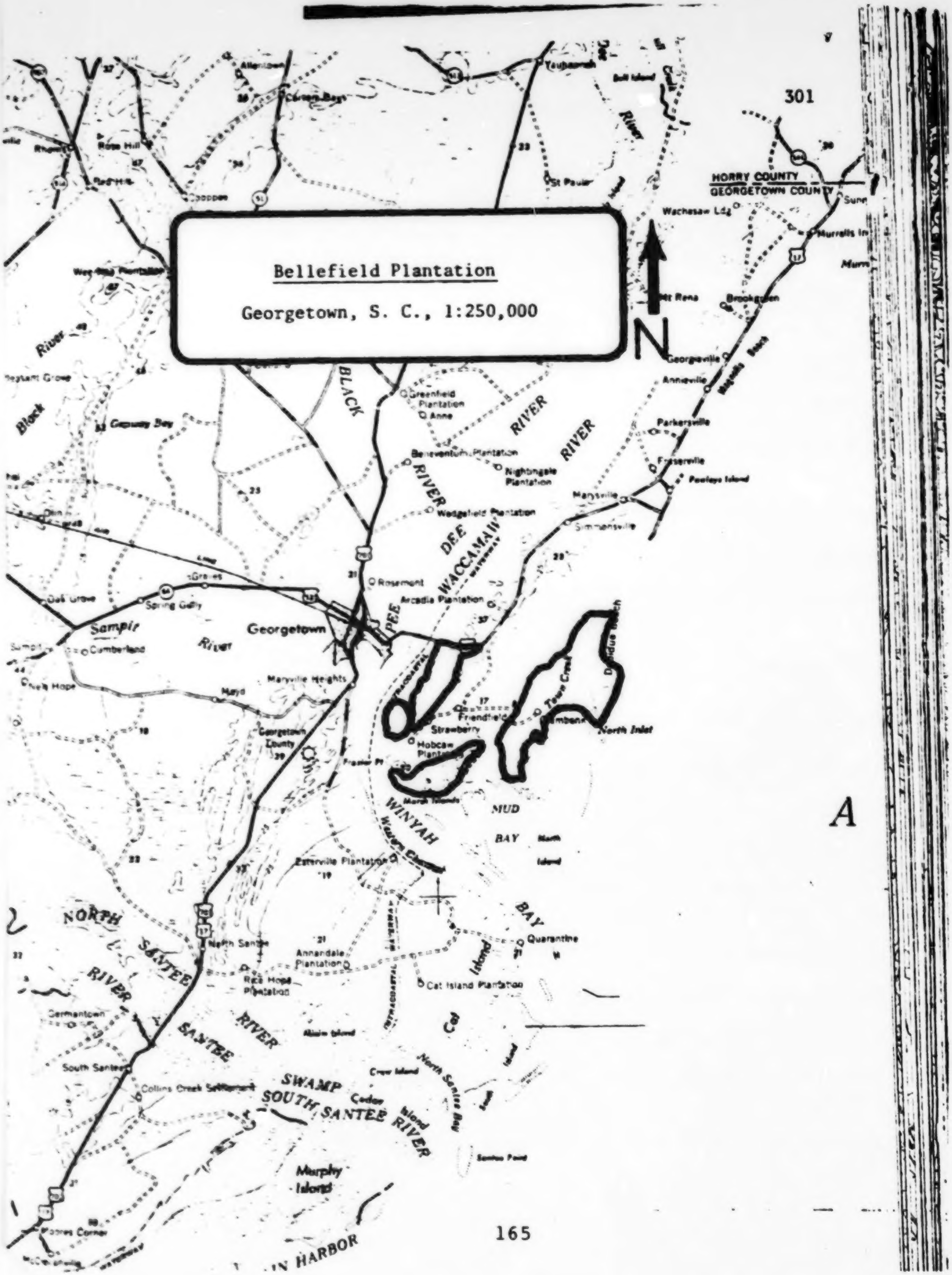
At least 30+ publications on area available from Belle W. Baruch, Coastal Research Institute, University of South Carolina, Columbia, South Carolina.

CONTACTS KNOWLEDGEABLE ABOUT AREA:

Dr. F. John Vernberg, Director, Belle W. Baruch Institute for Marine Biology and Coastal Research Institute, University of South Carolina, Columbia, South Caroline 29208 (803) 775-5288 or 777-5289.

RECOMMENDATION:

Recommended as potential Natural Landmark, however, more information is needed.



301
HORRY COUNTY
GEORGETOWN COUNTY
N
A
Allentown
Carters Bay
Yauhannah
Rose Hill
Rhems
Popper
Wachesaw Ldg
Murrells Inlet
Brookgreen
Georgeville
Anneville
Parkersville
Fraserville
Pawleys Island
Marysville
Simmonsville
Black River
Gapway Bay
Greenfield Plantation
Anne
Beneventum Plantation
Nightingale Plantation
Wedgefield Plantation
BLACK RIVER
PEE DEE RIVER
WACCAMAW RIVER
Rosemont
Arcadia Plantation
Graves
Spring Gully
Oak Grove
Sampit River
Georgetown
Cumberland
Maryville Heights
Friendfield
Strawberry
Hobcaw Plantation
Town Creek
Debordieu Beach
North Inlet
Frazier Pt
Marsh Islands
WINYAH BAY
MUD BAY
Western Channel
Estherville Plantation
NORTH SANTEE RIVER
North Santee
Annandale Plantation
Rice Hope Plantation
Cat Island Plantation
Cat Island
Quarantine
Germantown
South Santee
SANTEE RIVER
Collins Creek Settlement
SANTEE SWAMP
SOUTH SANTEE RIVER
Cedar Island
Crow Island
North Santee Bay
Santee Point
Murphy Island
HARBOR

Bellefield Plantation

Georgetown, S. C., 1:250,000

PRIORITY RATING: P = 2

NAME OF SITE: HUNTINGTON BEACH STATE PARK

ONE-LINE DESCRIPTION: Three miles of fine sand beach, dunes, inlets, marshland, ponds, and maritime forests.

THEME/SUBTHEME CLASSIFICATION: 10, 24, 29, 30, 32/A, Ca, Fb, Gb, Ne, Ob, Oa

LOCATION: Georgetown County, SOUTH CAROLINA

LATITUDE - LONGITUDE: 33° 20' North/79° 20' West

USGS QUADRANGLE REFERENCE: Brookgreen, 7.5'
Magnolia Beach, 7.5', S.C.

SIZE: 2,800 acres

OWNERSHIP: State

ADMINISTERING AGENCY: Division of State Parks, Department of Parks, Recreation and Tourism

CURRENT LAND USE: 30+% recreational by public (swimming, fishing, surfing, picnicking).

DANGERS TO AREA OR VULNERABILITY: Overuse by public; sea erosion.

SENSITIVITY OF AREA: None

SIGNIFICANCE OF AREA:

Ecological diversity and one of finest beaches on East Coast. Magnificent seaside area with lush marsh growth. Three miles of sand beaches, dunes, and freshwater marshes. Unspoiled barrier beach and sand dunes. Abundant shells exposed on beaches.

PHYSICAL CHARACTERISTICS: Three miles of white sand beach.

OUTSTANDING GEOLOGICAL FEATURES:

ECOLOGICAL DESCRIPTION:

Area has sand beach, dunes, salt marsh, freshwater ponds and maritime forest.

DOMINANT SPECIES OF PLANTS: Live oak, hickory, pine

DOMINANT SPECIES OF WILDLIFE: raccoons, many shorebirds, waterfowl, terns

RARE OR ENDANGERED SPECIES OF PLANTS OR WILDLIFE:

Terns, Osprey, Southern Bald Eagles (no nests) and American alligators

SCIENTIFIC REFERENCES ON AREA:

South Carolina Tidelands Report, p.54, South Carolina Water Resources Comm., 1970

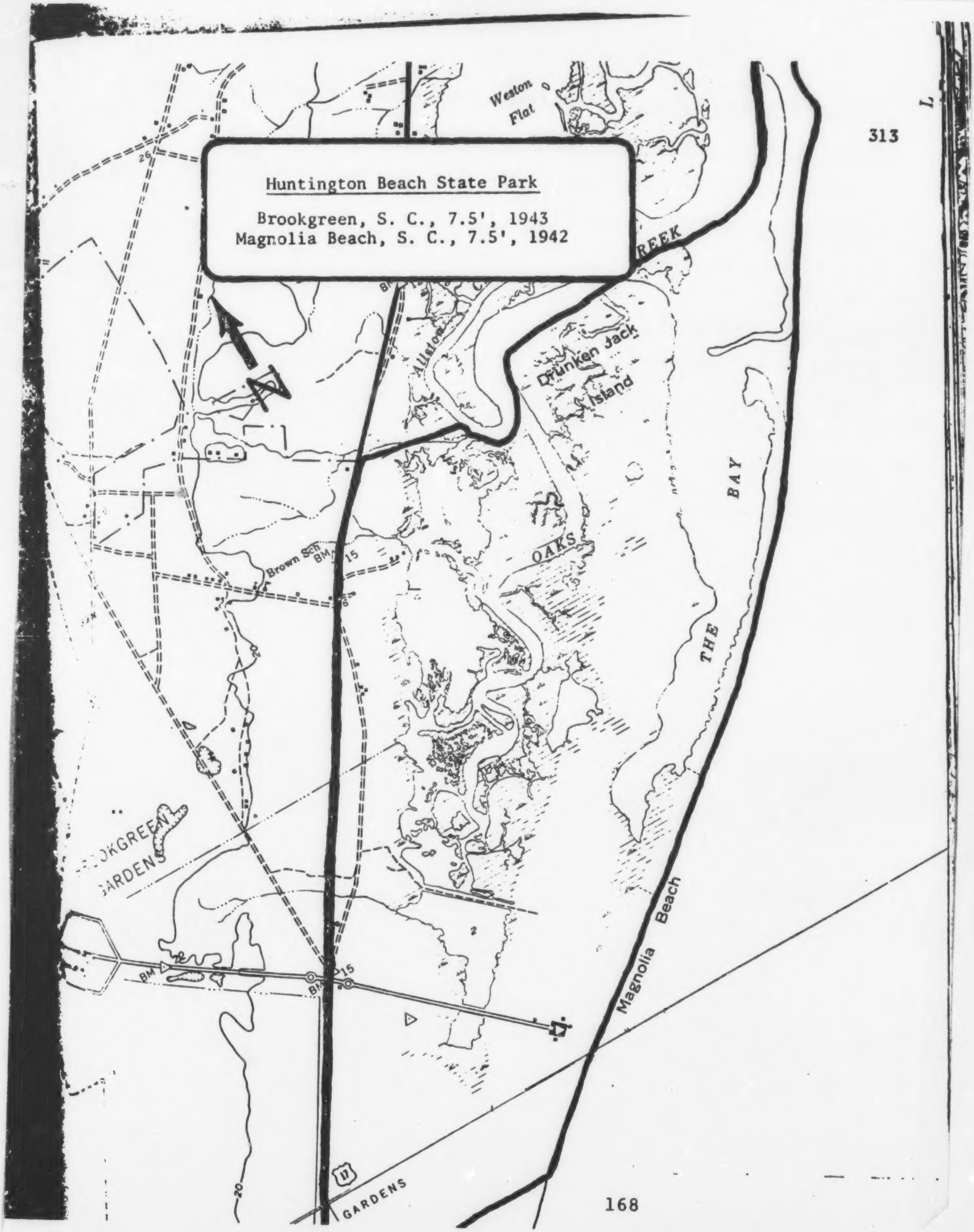
CONTACTS KNOWLEDGEABLE ABOUT AREA:

Mr. Van Stickle, Resident Manager, Huntington Beach State Park (803) 237-4440.

Mr. Bob Papenfus, Chief Naturalist, Division of State Parks, Department of Parks, Recreation and Tourism, Columbia, South Carolina.

RECOMMENDATION:

Recommended as potential Natural Landmark.



Huntington Beach State Park

Brookgreen, S. C., 7.5', 1943
Magnolia Beach, S. C., 7.5', 1942

Weston Flat
CREEK
Allston
Drunken Jack Island
OAKS
THE BAY
Brown Sch
BM 15
26
BROOKGREEN GARDENS
Magnolia Beach
BM
BM 15
2
17
GARDENS
20

SC5. **Hobcaw Forest.** Acreage: Unknown.

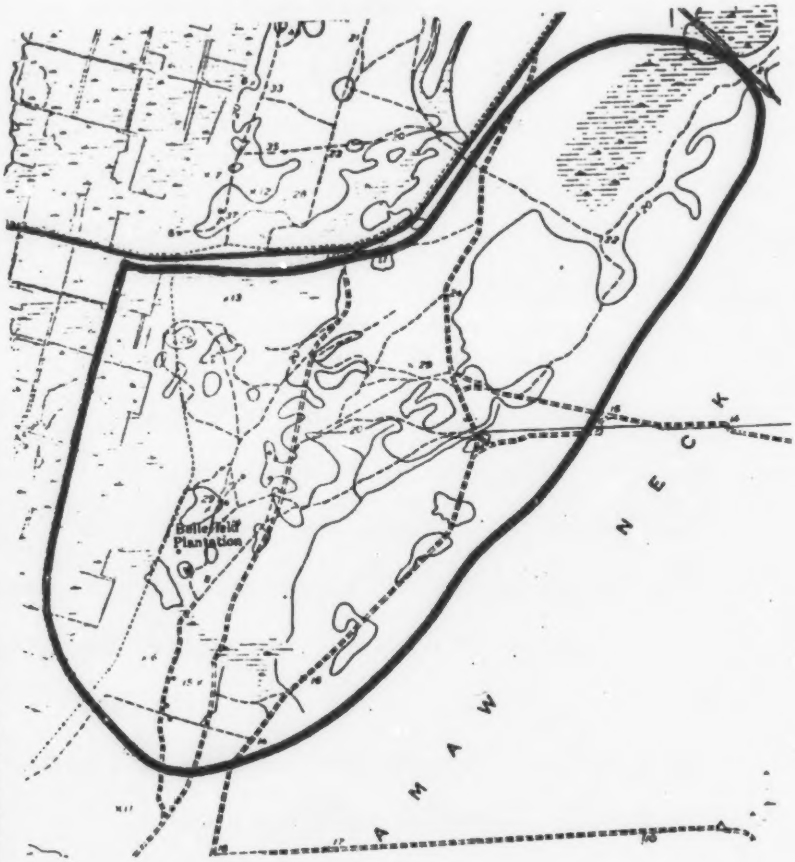
Location: Georgetown Co., just N across the Pee Dee River from Georgetown on Rt. 17. North Island Quadrangle.

Description: This area is dominated by **Pine Flatwoods** consisting of longleaf pine, with an understory of turkey oak, blue jack oak, scrubby post oak, and black jack oak. Cypress-Gum Swamp Forest also is represented on this site. The vegetation of the area has been described in: Barry, J. M., and W. T. Batson. 1969. The vegetation of the Baruch Plantation, Georgetown, South Carolina, in relation to soil types. *Castanea* 34(1):71-77.

Ownership: Belle Baruch Foundation.

Data Source: Personal field examination.

Priority: 1.



Hobcaw Forest

The Hobcaw Forest is part of the Baruch Plantation at Georgetown. Since the death of Bernard Baruch it has been under the control of the Baruch Foundation with the Clemson School of Forestry active in its management.

The Spanish under the leadership of Lucas Vazquez de Ayllon attempted a settlement there in 1526 but dissention and disease soon forced their abandonment. The rise of English influence resulted in 1718 in a grant by George II to Lord Carteret of the original Hobcaw Barony. During succeeding generations the Barony was divided several times but purchases by Baruch just before the middle of this century largely collected together again the original holdings.

The coastal route of the Indians from what is now Wilmington to Charleston continued to be used by the colonists as the King's Highway and was traveled by George Washington during his presidential tour in 1791. Much of what is now U.S. #17 is this old highway.

This very large plantation lies about three miles north of the city of Georgetown and occupies the southernmost part of an area known as Waccamaw Neck. It is surrounded by water on three sides. On the south and west it is bordered by Winyaw Bay and on the east by the Atlantic Ocean. About 7000 of its 17,000 acres are forests which vary from pine and turkey oak associations, characteristic of the central part of the state, to cypress-gum swamps. The area now designated as the natural area is a 285 acre tract surrounding the upper and innermost end of the tidal marsh known as the Thousand Acre Rice Field.

Some variation exists in the topography of the natural area since it slopes up, although almost imperceptably, from the high tide line.

Some variation also exists in the soil. The major portion is underlain by the St. Johns series which runs from moist to dry with very little likelihood of standing water, at least for any significant lengths of time. Rutledge Sand, Leon and Onslow Loamy Sand make up the remainder of the area. The Leon series closely resembles the St. Johns in both character and vegetative cover.

Narrow fingers of Rutledge Sand underlie the low, often under water, swampy parts. The very small area of Onslow Loamy Sand is well drained and heavily vegetated.

In terms of the arboreal dominants this tract is somewhat like the Congaree Swamp and the de la Howe Forest. The most numerous big trees are pines of the loblolly and longleaf types and not much pine reproduction is in evidence. Unlike the other two areas, Hobcaw is within the Southeastern Evergreen or Pine belt where pines are to be expected, but the lack of significant reproduction will eventually result in transformation to a hardwood forest closely related to the type once common in the Piedmont. The large pines are reported by Mr. Nolan Taylor, long time caretaker of the area, to be from 80 to 160 years old and since but little reproduction is in evidence continued pine dominance seems dependent on some missing factor. In light of the view held by many that pines are a disc climax the factor that may be missing is fire. Fire would have kept the shrub and ground layers thin and the canopy more or less free of hardwoods. As it is, shrub and ground cover layers are mostly very dense and hardwoods are well represented in the canopy. All of this prevents the heliophytic pine seedlings from getting started.

Several penetrating transects yielded the following:

Trees -- Pinus, Liquidambar, Quercus (Live, Laurel, Post, Water), Nyssa sylvatica, Persea, Diospyros, Magnolia virginica, Acer Sassifras, Taxodium and Nyssa aquatica.

Shrubs --Arundinaria, Clethra, Hypericum, Ilex, Lyonia, Myrica, Gelsemium, Rhus (copallina, radicans), Smilax (2), Vaccinium (3), Tillancsia, Vitis, Sabal and Parthenocissus.

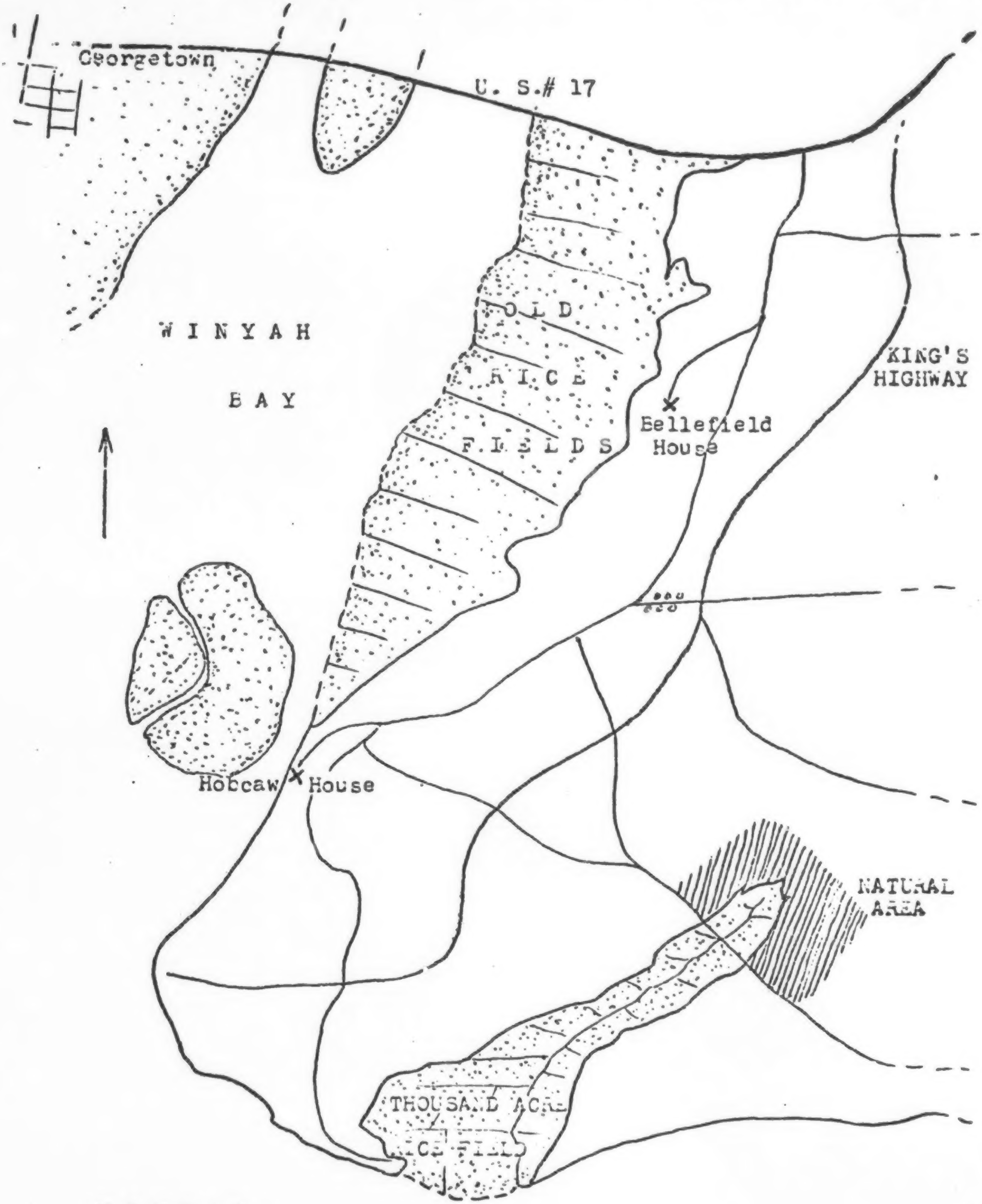
Herbs -- Andropogon, Pteridium, Panicum, Polygala, Pterocaulon, Clitoria, Centella, Rhynchospora, Tephrosia, Carex, Uniola, Oplismenus.

Mikania, Justica, Juncus, Solidago, Eupatorium and Oxalis.

The upper end of the tidal marsh is included in the natural area but is considered in this report not to be a part of the Hobcaw Forest. The area of it comprises only 10-15% of the whole, if that.

I am certainly enthusiastic about preserving and recognizing any natural area but I am less so about this one than most. It seems likely to be in for long protection and it will be interesting to see what progressive changes take place in the future. It lies in a well known plantation and where much research is likely to take place. It will be viewed and possibly referred to by many. If progression from disc climax to climax is finally taking place the last stages of this and the final result will be interesting.

It is with some hesitation that I recommend this areasas a Registered Natural Landmark.


Georgetown
U. S.# 17
WINYAH
BAY
OLD
RICE
FIELDS
Bellefield
House
KING'S
HIGHWAY
Hobcaw
House
NATURAL
AREA
THOUSAND ACRE
RICE FIELD
WINYAH
BAY

HOBCAW FOREST